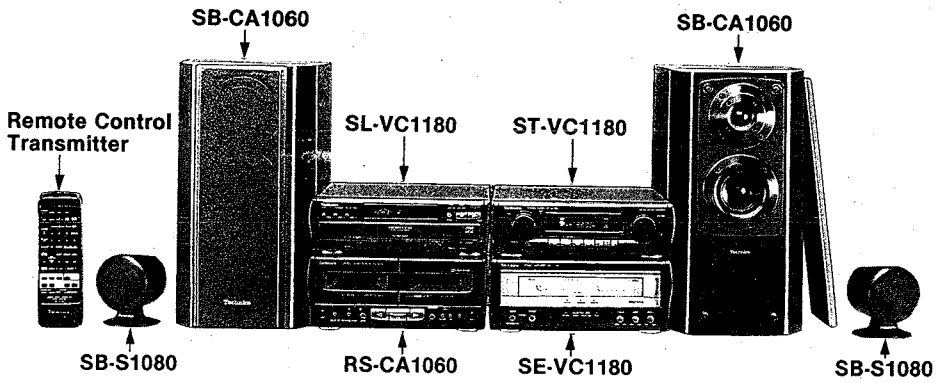
ORDER NO. AD9506160C2

Service Manual

COMPACT disc DIGITAL VIDEO COMPACT disc DIGITAL AUDIO DIGITAL MASH* multi-stage noise shaping

Video CD Changer

SL-VC1180



Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)

System: SC-VC1180

Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

TRAVERSE DECK: RAE0113Z MECHANISM SERIES

■ SPECIFICATIONS

■ Audio

DA converter 1 bit 2 DAC MASH

■ Video CD

Physical format: Based on CD-ROM format
Video data: Based on MPEG1
Audio data: Based on MPEG1 Layer 2

■ Video output

Video format: PAL/PAL 60 Hz
Output voltage: 1 Vp-p, 75 Ω

■ Pickup

Wavelength 780 nm

■ General

Dimensions (W × H × D) 280 × 89 × 325 mm
Weight 3.3 kg

Notes:

1. Weight and dimensions shown are approximate.
2. Design and specifications are subject to change without notice.

※ MASH is a trademark of NTT.

System	Tuner	Video CD Changer	Amplifier	Cassette deck	Speaker
SC-VC1180	ST-VC1180	**SL-VC1180**	SE-VC1180	RS-CA1060	*SB-CA1080 (SB-CA1060+SB-S1080)

*: Made in PAES

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

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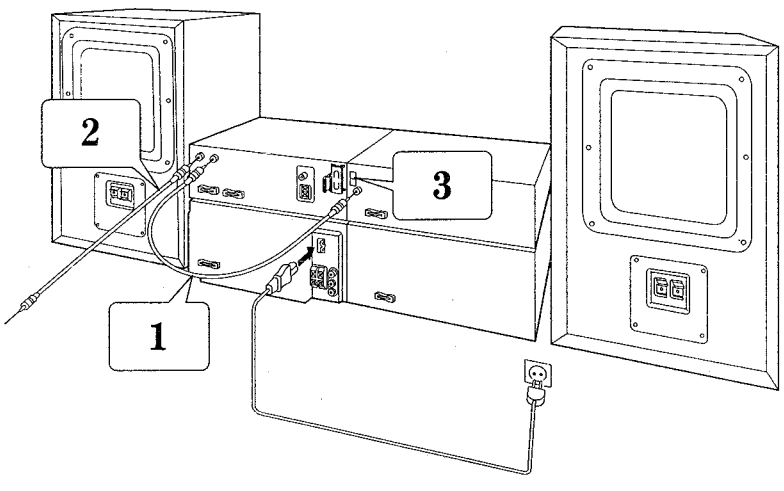
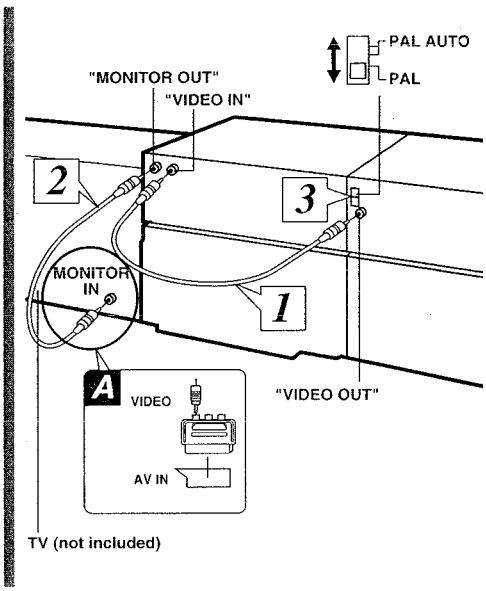
Note: Refer to the Accessories and Packaging of Service manual for Model No. SE-VC1180, Order No. AD9506167A2.

■ CONNECTIONS





(For video CD playback)

1. Connect the video connection cable from the VIDEO OUT terminal to the VIDEO IN terminal.
2. Connect the video connection cable from the MONITOR OUT terminal to the MONITOR IN terminal of the TV.
3. Set the VIDEO OUT switch according to the television set to be connected.

PAL: When connecting the PAL system TV.

PAL AUTO: When connecting the TV which has PAL 60 Hz system.
(This is the system which enables to enjoy NTSC software.)

For details, refer to the operating instructions of TV.

If your television set has 21 pin plug terminal: A

1. Connect the video connection cable to the 21 pin adaptor (included).
2. Connect the 21 pin adaptor to the TV set.

■ PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780nm
Maximum output radiation power from pickup: 100μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

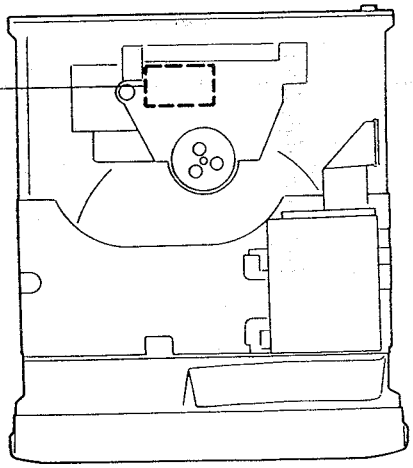
Wellenlänge: 780nm
Maximale Strahlungsleistung der Lasereinheit: 100μW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinhit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

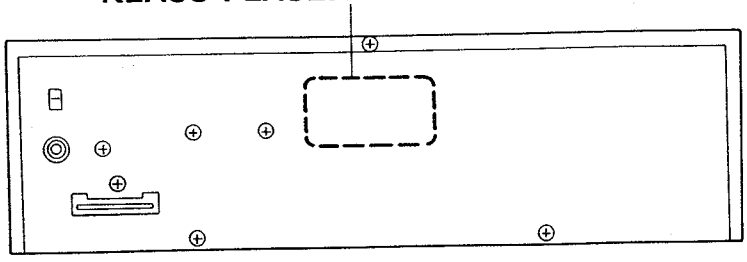
ADVARSEL: I dette a apparat anvendes laser.

DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING. NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN. RQLS0104



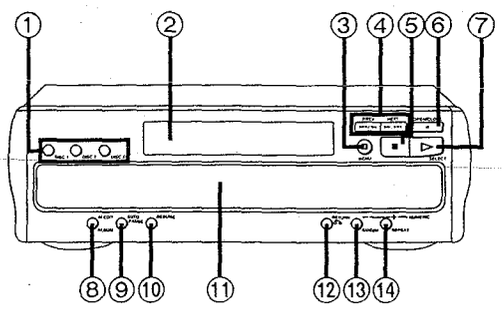
CLASS 1
LASER PRODUCT

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT



CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

■ LOCATION OF CONTROLS



No.	*Name*
①	Disc number select buttons (DISC1, DISC2, DISC3)
②	Display section
③	Stop button (□)
④	Skip/search buttons (I◄◄/◄◄, ►►/►►I)
⑤	Pause button (▯▯)
⑥	▲ OPEN/CLOSE button (OPEN/CLOSE, ▲)
⑦	Play button and indicator (▷)
⑧	AI edit button (AI EDIT, ALBUM)
⑨	Auto pause button (AUTO PAUSE)
⑩	Resume play button (RESUME)
⑪	Loading drawer

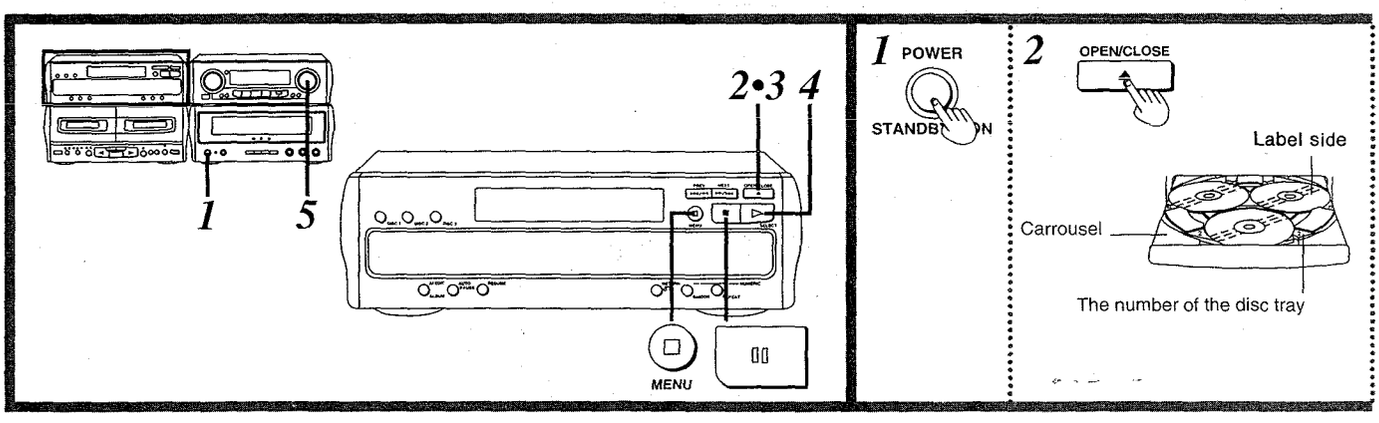
No.	*Name*
⑬	Random play button (RANDOM)
⑭	Repeat button (REPEAT)

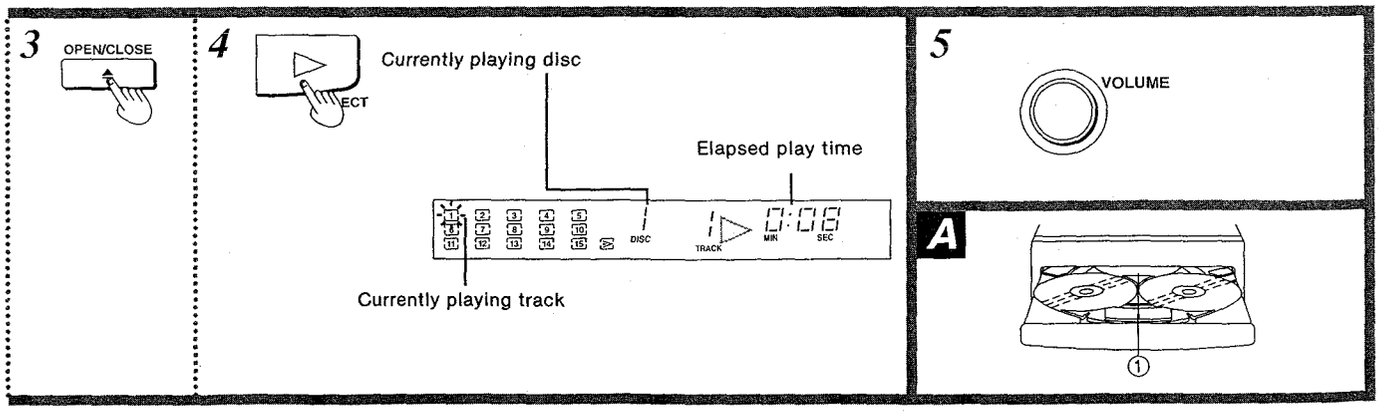
Exclusive use for the video CD MENU play

(Blue printed part on the panel)

③	MENU ON/OFF button (MENU)
④	Previous (PREV), next (NEXT) buttons
⑦	SELECT button (SELECT)
⑫	RETURN button (RETURN, ↶)
⑬ ⑭	+, −, NUMERIC buttons (−, +, NUMERIC)

■ PLAYING AUDIO CDS AND VIDEO CDS (NO EQUIPPED WITH THE PLAYBACK CONTROL FUNCTION)





Preparation: (When you playing video CDs)
Switch on the power of the TV, and select the VIDEO input mode.
Refer to the operating instructions of the TV.

1 **Switch on the power.**

2 **Press ▲ OPEN/CLOSE to open the loading drawer.**
Insert CDs with label facing upward.
Disc 1=CD on the disc tray 1
Disc 2=CD on the disc tray 2
Disc 3=CD on the disc tray 3
Do not load 8 cm and 12 cm discs on the same disc tray.
Be sure to load a 8 cm disc correctly at center position.

3 **Press ▲ OPEN/CLOSE to close the loading drawer.**

4 **Press "▷, SELECT".**
Play starts from the first track on the first disc, and stops after playing the last track on the last disc.
Concerning the cross over display:
The video CD changer display shows the disc movement, playback operation, and disc information at the same time using the two-tone color indicator.

5 **Adjust the volume level as you like.**

To stop the disc play:
Press "□, MENU".

To temporarily stop the disc play:
Press ▯▯.
"▮▮" indicator lights.
To play again, press ▯▯.

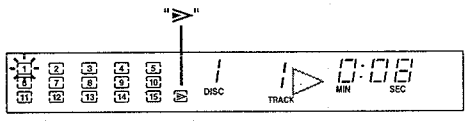
To exchange discs during play:
While a disc is playing, you can exchange discs.
1. Press ▲ OPEN/CLOSE during playing.
   The loading drawer will open at half position.
2. Exchange discs.
3. Press ▲ OPEN/CLOSE again to close the loading drawer.

To open fully, press "□, MENU" before opening the loading drawer.

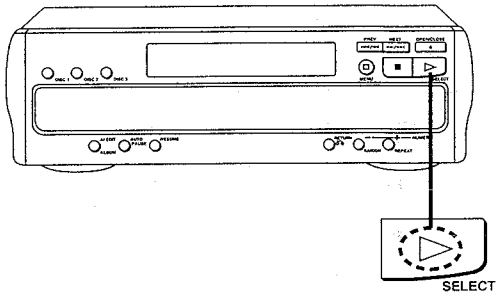
Note

Do not insert another disc onto tray placed at ①, although the tray is partially showing, its disc is in the play position. **A**

A



B



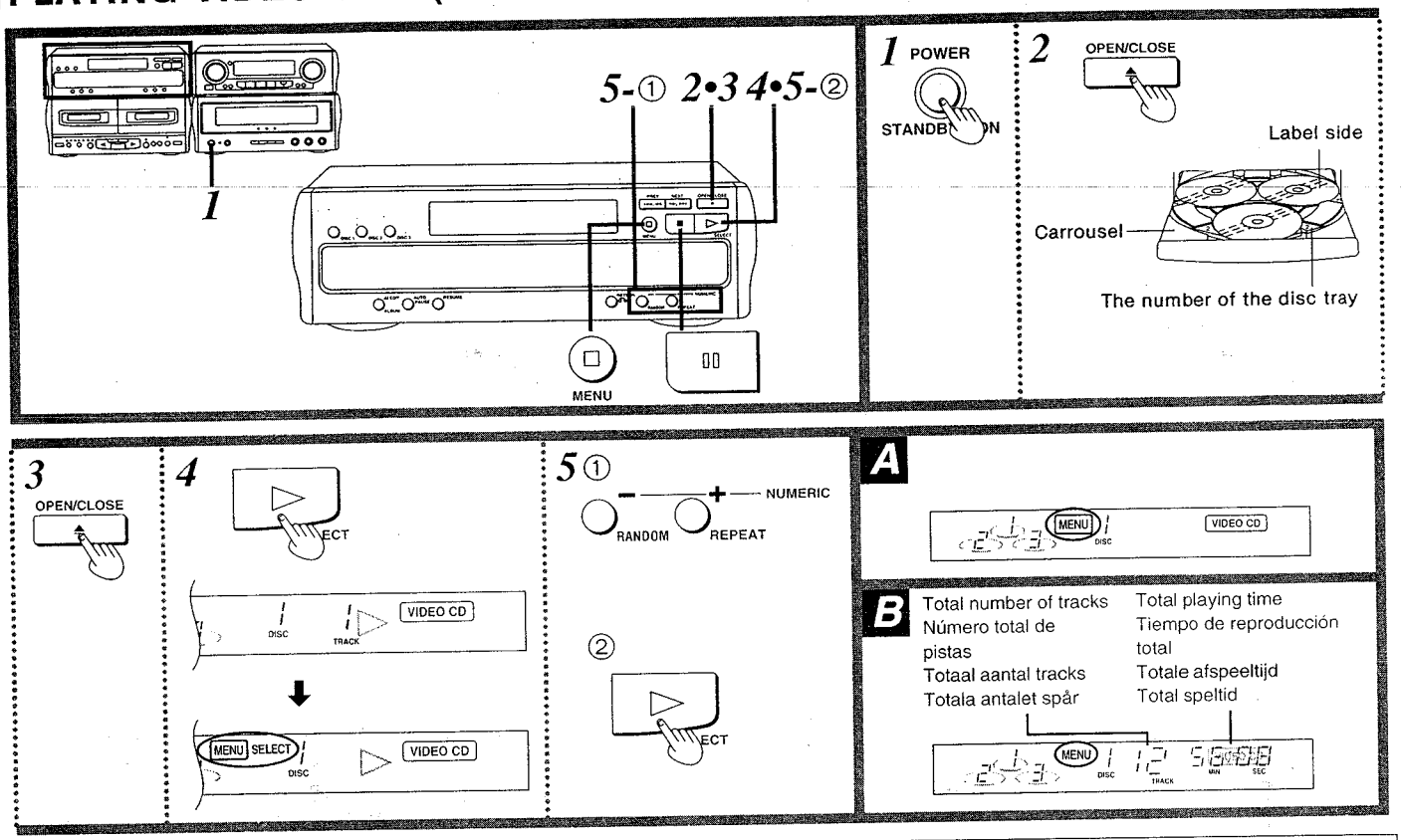
When " ⩥ " appears on the display: A
It indicates there are 16 or more tracks on the disc at the playing position.

Concerning the total playing time of a CD on the display:
The total play time including the gaps between the tracks is indicated. This is why the time may be several seconds longer than the figure given in the liner notes, etc.

For your reference:
- If you press "▷, SELECT" instead of ▲ OPEN/CLOSE after inserting disc(s), the loading drawer will close and play will start directly.
- If you play a disc with the loading drawer half open, the changer will automatically stop when the last track on the current disc finishes playing.
- When it is found that no CD is on the selected disc tray, the changer will play a CD on the next disc tray.
- When you start playing from the disc 2 or disc 3, the changer will play CDs in the following order, and then stops automatically.
  When you start playing from disc 2: Disc 2→3→1
  When you start playing from disc 3: Disc 3→1→2

About the ▷ indicators on the button: B
While halted: Lights up orange.
While playing: Lights up green.
While paused: Flahses in green.

■ PLAYING VIDEO CD'S (WITH THE PLAYBACK CONTROL FUNCTION)



The playback method described below is only for video CDs equipped with the playback control function. Menu playback is automatically played when a video CD is playback control supported.

1 Switch on the power.

2 Press ▲ OPEN/CLOSE to open the loading drawer.
Insert the video CD with label facing upward.
Do not load 8 cm and 12 cm discs on the same disc tray.
Be sure to load a 8 cm disc correctly at center position.

3 Press ▲ OPEN/CLOSE to close the loading drawer.

4 Press "▷, SELECT".
The menu screen appears on the TV. (with some discs, it may not appear immediately.) The menu screens that appear may differ depending on the disc.

5 ① Press + or − to select the menu item.
+: When selecting the bigger number
−: When selecting the smaller number
② Press "▷, SELECT" to start play.

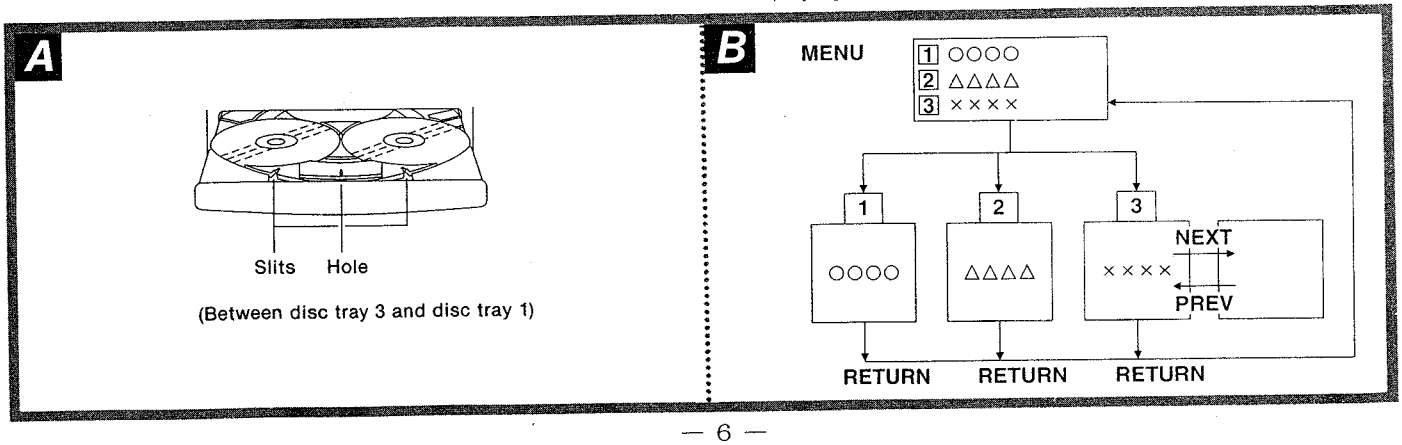
The menu operation differs depending on the disc. Select the menu by following the instructions accompanying the disc or the screen display.
The display shows the menu number or another menu, etc. and then playback will start. The unit also identifies and plays the high-resolution still image automatically.

You can select the menu number using the remote control transmitter.

To stop the disc play:
Press "□, MENU".
- "MENU" lights up when the loaded CD is the playback control supported. **A**
- When you press the button again it switches to the regular playback mode. **B**

While in the regular playback mode, the frame around "MENU" lights off.

To temporarily stop the disc play:
Press ▯▯.
"❚❚" indicator lights.
To play again, press ▯▯.



Avoid following things to prevent the malfunction or incorrect operation.

- Menu playback and regular playback is switched automatically depending on a disc loaded.
  When you make a regular playback with a playback control supported disc, press "□, MENU" to switch to the regular playback mode.
- Do not move this changer with a compact disc inside the unit. If a disc comes off the disc tray, it might be scratched or the changer might become incapable of playing.
- Do not push the loading drawer to close.
- Do not cover the hole (DISC SENSOR) or slits. **A**
- Do not turn the tray forcibly by hand because it may fail to operate normally.

Notes

- Menu playback and regular playback is switched automatically depending on a disc loaded. When you make a regular playback with a playback control supported disc, first press "□, MENU" to switch to the regular playback mode.
- With some discs, the motion picture in the menu screen may not pause even when ▯▯ is pressed during playback.

To select a two digit menu number using the remote control:

Press ≥10/-/--, and then press the numeric button corresponding to the desired track number.

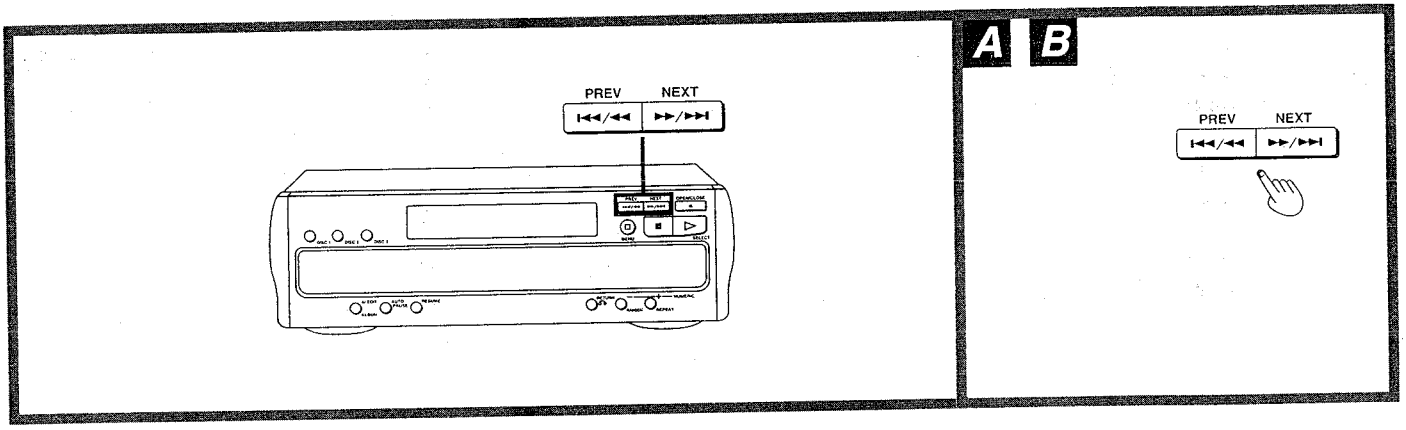
For example:

Track 13: ≥10/-/--→1→3
Track 20: ≥10/-/--→2→0

When you go into the menu operation:

While in the operation, press "□, MENU" and confirm the menu screen is switched and then proceed to the next operation.

Menu operation (Blue printed part on the panel)	
To return to the previous menu (↶)	RETURN
To advance to the continuation of the menu (NEXT)	NEXT ▶▶/▶▶I
To return to the previous screen (PREV)	PREV I◀◀/◀◀
To switch to the menu play/ regular play mode	Press in the stop condition □ MENU
The figure is one of the examples. **B** The menu operation differs depending on the disc.	



Search functions A

While in play mode, press and hold either I◀◀/◀◀ or ▶▶/▶▶I.

▶▶/▶▶I: To search forward
I◀◀/◀◀: To search backward

Release the button when you have reached the desired point.

Note

You may not be able to search forward or backward while playing some "slide show" discs (discs which show a series of still pictures.).

For your reference:

There are some discs which have tracks constructed only with audio signal.
If the video CD changer find out the track which is constructed only with audio signal while searching, the search operation will be automatically switched to start playing the track. When you want to search continuously, release the button once, and then press and hold the button until the desired track is reached.

High-speed search function B

While checking the elapsed play time displayed on the TV screen, you can search forward or backward with high speed.

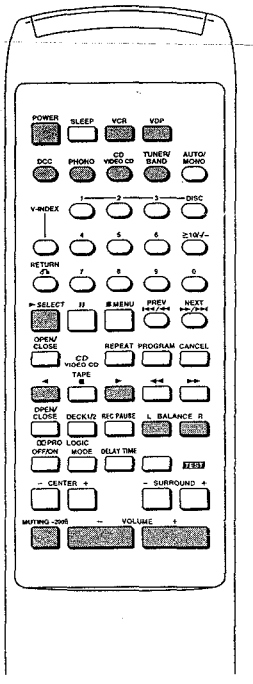
While in pause mode, press and hold either I◀◀/◀◀ or ▶▶/▶▶I.

▶▶/▶▶I: To search forward
I◀◀/◀◀: To search backward

The play will automatically start when you release the button.

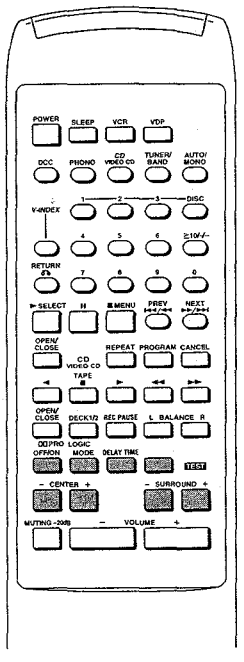
■ QUICK REFERENCE OF REMOTE CONTROL OPERATIONS

Common operation



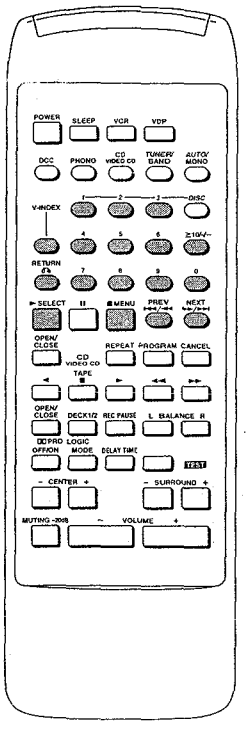
Switching the system on and power standby mode	POWER
Starting play directly from the power standby condition	►SELECT, TUNER/BAND, ◄, ►
Selecting the input source	VCR, VDP, DCC, PHONO, CD VIDEO CD, TUNER/BAND
Adjusting the volume	−VOLUME+
Adjusting the volume balance	L BALANCE R
Muting the volume temporarily	MUTING -20dB

Dolby Pro-Logic Surround operation



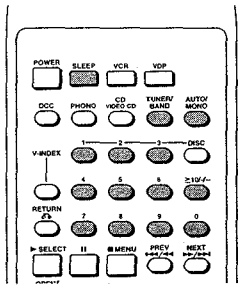
Switching Dolby Pro-Logic Surround mode on or off	OFF/ON
Switching between Dolby Pro-Logic Surround modes	MODE
Adjusting the delay time	DELAY TIME
Activating the test signal sound	TEST
Adjusting the center speaker level	− CENTER +
Adjusting the surround speaker level	− SURROUND +

Video CD section



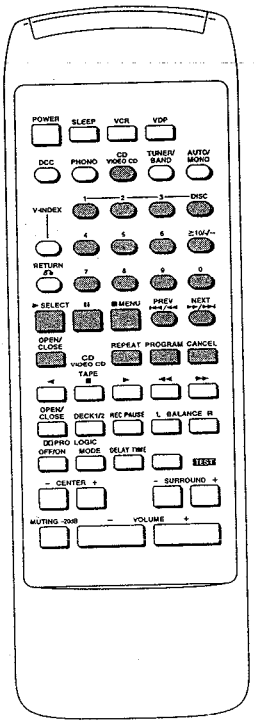
Returning to the previous menu	(During the menu playback only) RETURN
Proceeding to the next display	(During the menu playback only) NEXT
Returning to the previous display	(During the menu playback only) PREV
Fixing the menu number	(During the menu playback only) ►SELECT
Selecting the menu number (During the menu playback only)	1 2 3 / 4 5 6 ≥10/-/- / 7 8 9 0
Switching to the menu playback/regular playback mode	In the stop mode ■MENU
Searching forward/backward	Press and hold in the play mode. PREV NEXT
Skipping forward/backward (During the regular playback only)	During play PREV NEXT
Searching forward/backward with high speed	Press and hold in the pause mode PREV NEXT
Searching for the scene using a video index number	V-INDEX → 1 2 3 / 4 5 6 ≥10/-/- / 7 8 9 0

Tuner, timer operation



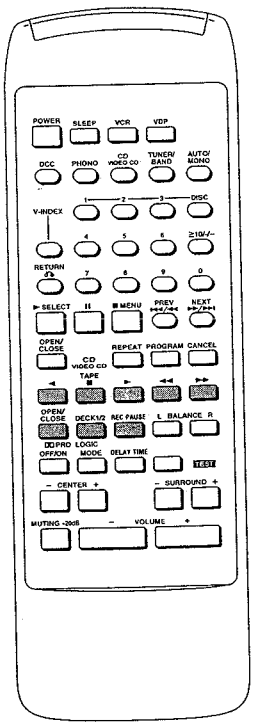
Listening to radio broadcasts	TUNER/ BAND → 1 2 3 / 4 5 6 ≥10/-/- / 7 8 9 0
Switching between FM stereo mode and monaural	AUTO/ MONO
Operating/releasing the sleep timer	SLEEP

Compact disc section



Opening or closing the disc tray	OPEN/ CLOSE
Starting play	►SELECT
Temporarily stopping play	II
Stopping play	■MENU
Skipping tracks	PREV ⏮/◄◄ NEXT ►►/⏭
Repeating play	REPEAT
Starting play from a particular track	CD VIDEO CD → DISC → 1 2 3 → 4 5 6 ≥10/-/-- 7 8 9 0
Playing the particular track you programmed	CD VIDEO CD → DISC → 1 2 3 → PROGRAM → ►SELECT ← 1 2 3 4 5 6 ≥10/-/-- 7 8 9 0
Cancelling the particular track you programmed	CD VIDEO CD → DISC → 1 2 3 → CANCEL → CANCEL ← 1 2 3 4 5 6 ≥10/-/-- 7 8 9 0

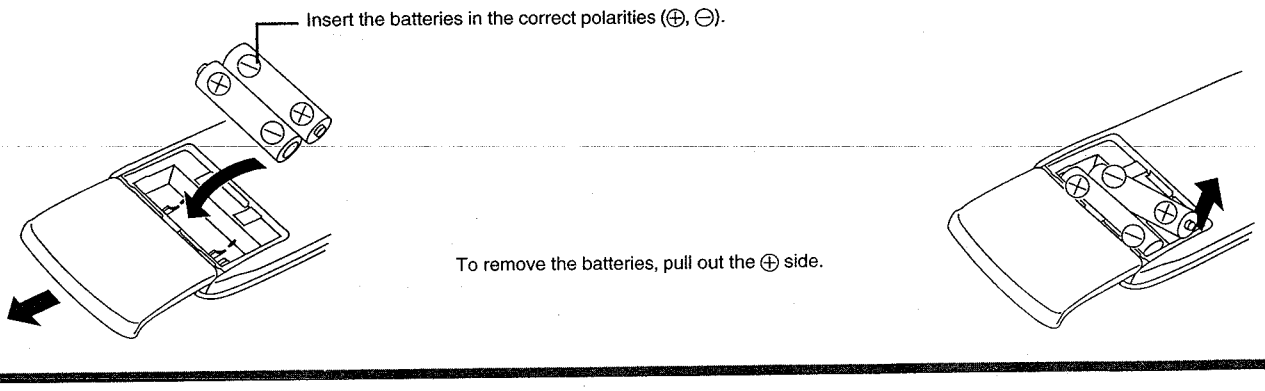
Tape section



Switching between deck 1 and deck 2	DECK1/2
Opening or closing the cassette holder	OPEN/ CLOSE
Starting playback	◄ ►
Finding the beginning of a track	During playback ◄◄ ►►
Fast forwarding or rewinding the tape	In stop mode ◄◄ ►►
Stopping playback	■
Recording	REC PAUSE → ◄ ►

■ PREPARING FOR THE REMOTE CONTROL

A



Battery installation A

Use of batteries

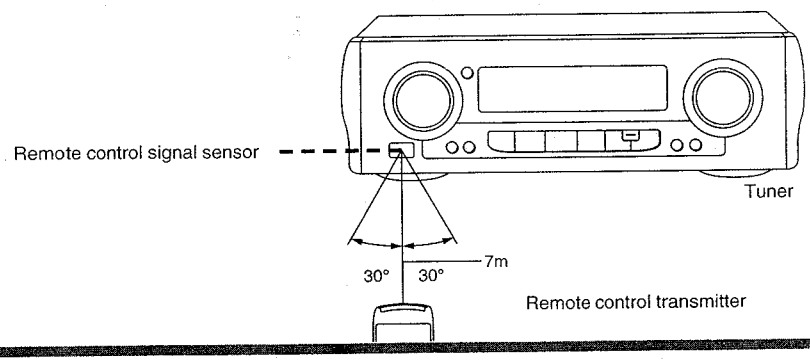
- Do not mix old and new batteries, or batteries of different types (manganese and alkaline, etc.).
- Never subject batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
- If the remote control is not to be used for a long period of time, remove the batteries and store them in a cool, dark place.
- Do not attempt to recharge alkaline or manganese batteries.

Battery life

The battery life is about one year.

The batteries should be replaced if commands from the remote control transmitter do not operate the unit even when the transmitter is held close to the front panel.

B



Correct method of use B

Operation notes

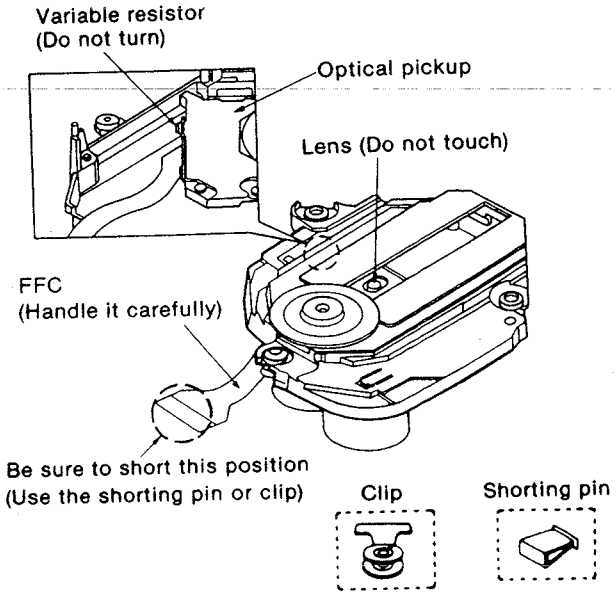
- Aim the remote control's transmission window toward the unit's sensor. Avoid any obstacles.
- The maximum distance is within 7 meters directly facing toward the remote control signal sensor.
- Be sure the transmission window and the unit's sensor are free from dust. Excessive dust might affect its performance.
- The operation may not be correct if direct sunlight or other strong light source strikes the receiving sensor of this unit. If there is a problem, place the unit away from the light source.
- If this system is installed in a rack with glass doors, the glass doors' thickness or color might make it necessary to use the remote control a shorter distance from the system.
- Never place heavy items.
- Do not disassemble or reconstruct.
- Do not spill water or other liquids.

■ HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

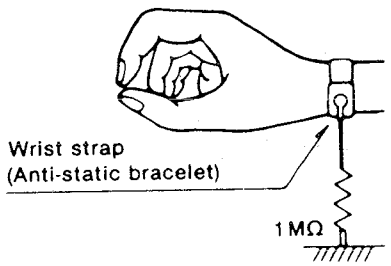
• Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FFC).
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FFC).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

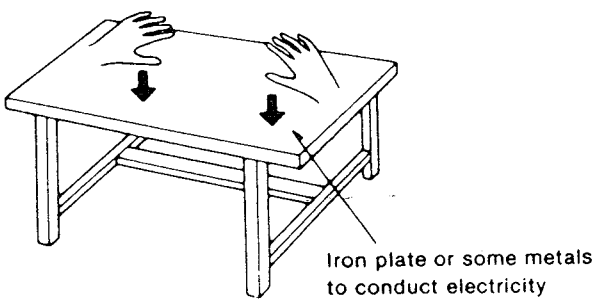


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table gounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.



Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



■ OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURES

Warning: This product uses a laser diode. Refer to caution statements on page 3.
ACHTUNG: • Die lasereinheit nicht zerlegen.
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

NOTE

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Illustrated screws are equivalent to actual size.**
5. **Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.**

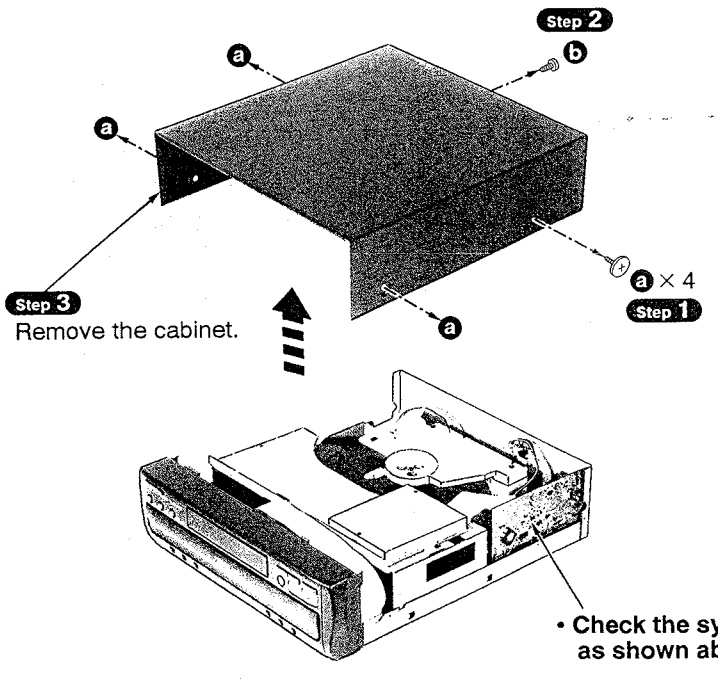
• Contents

• Checking Procedures for each P.C.B. Page.
1.Checking for the system control P.C.B. and video P.C.B.. ..... 13,14.
2.Checking for the main P.C.B.. ..... 14~16.
3.Checking for the servo P.C.B.. ..... 17,18.

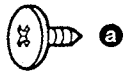
• Main Component Replacement Procedures
1.Replacement for the traverse deck ass'y. ..... 18,19.
2.Replacement for the belt, motor ass'y and solenoid. ..... 19~21.

■ Checking Procedure for each P.C.B.

1. Checking for the system control P.C.B. and video P.C.B.

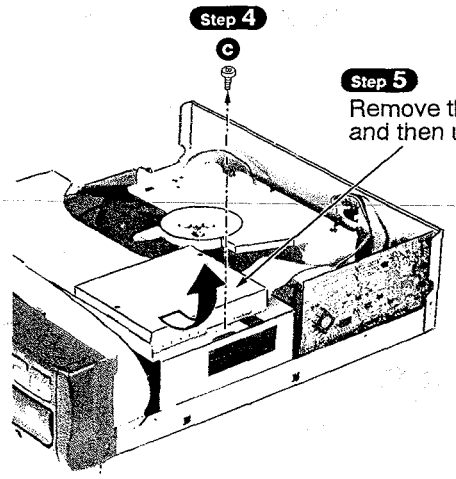


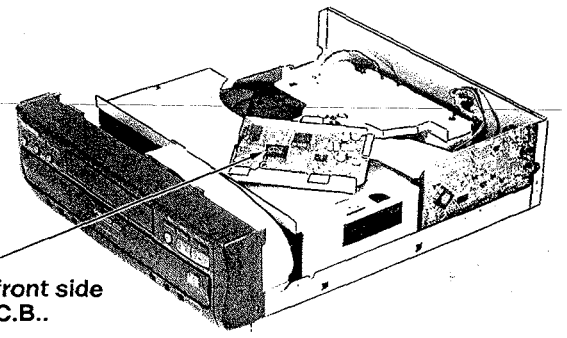
NOTE
Apply power with using power supply tool.

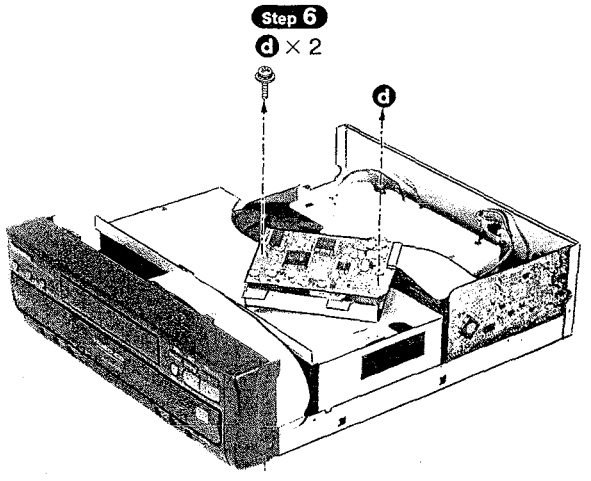

[RHD30007-K1] (Black)

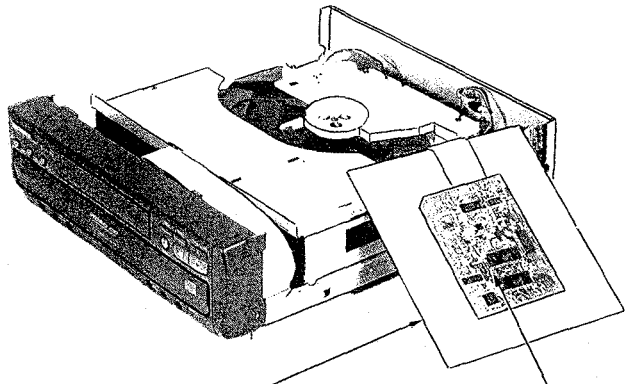
[XTBS3+8JFZ1](Black)

• Check the system control P.C.B. as shown above.







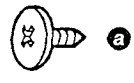


[XTBS3+8JFZ1] (Black)

[XYC26+JF6]

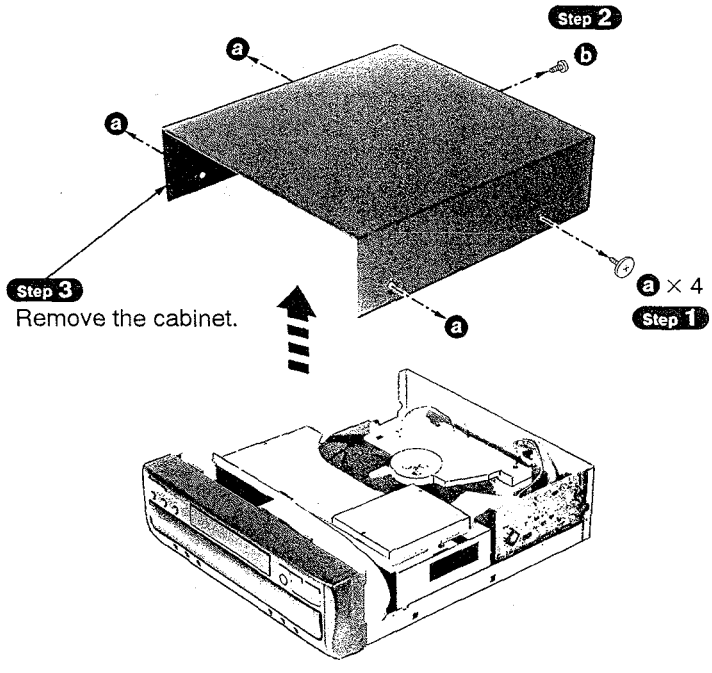
NOTE
Insulate with insulation material to avoid short circuit.

2. Checking for the main P.C.B.

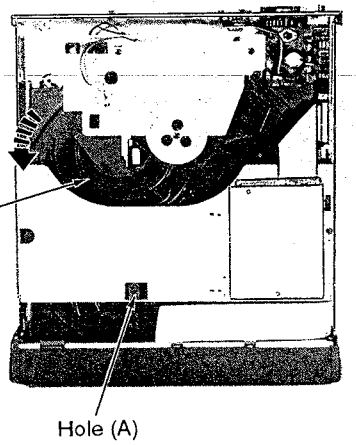


[RHD30007–K1] (Black)

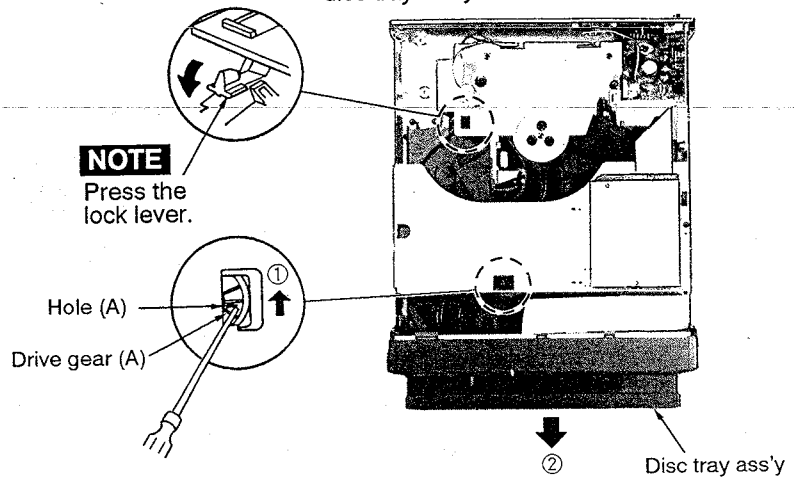
[XTBS3+8JFZ1] (Black)



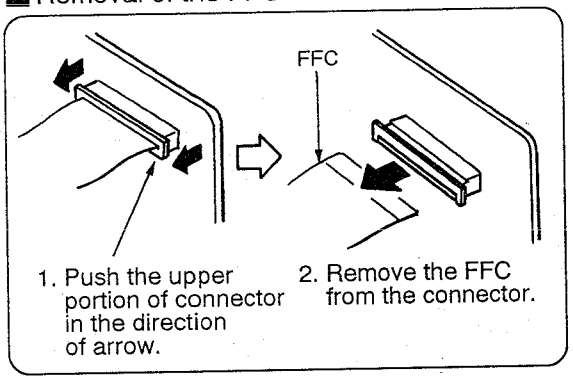
Step 4
Rotate the rotary tray to the position that can be confirmed the hole (A).



Step 5
Pressing the drive gear (A) in the direction of arrow ①, the disc tray ass'y moves slightly in the direction of arrow ②. Then, pull the disc tray ass'y in the direction of arrow ②.

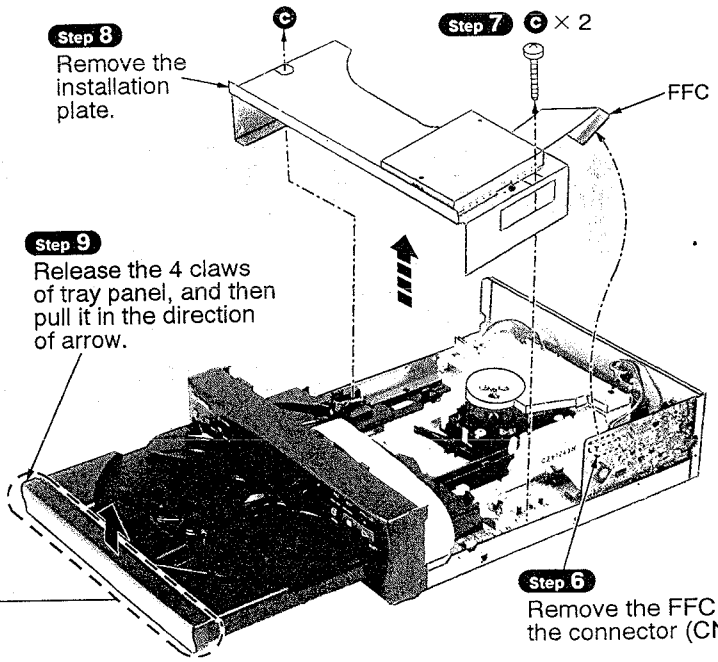


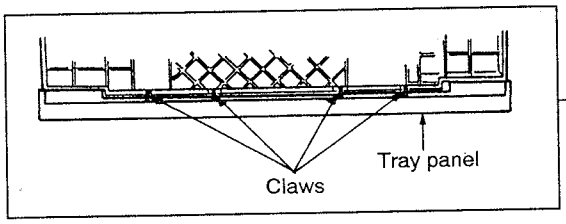
■ Removal of the FFC



Step 8
Remove the installation plate.

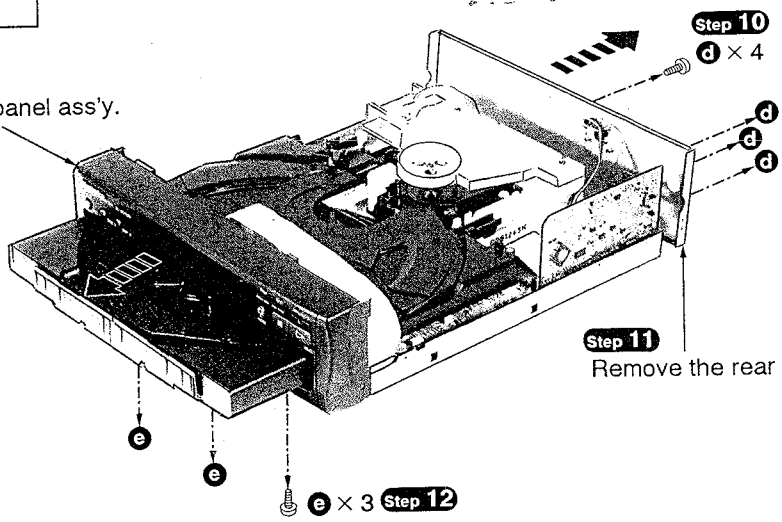
Step 7 ⓒ × 2


ⓒ
FFC
Step 9
Release the 4 claws of tray panel, and then pull it in the direction of arrow.
Step 6
Remove the FFC from the connector (CN404).



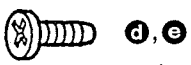
Step 10 ⓓ × 4

Step 13
Remove the front panel ass'y.



Step 11
Remove the rear panel.

[XTB3+16JFZ] (Black)

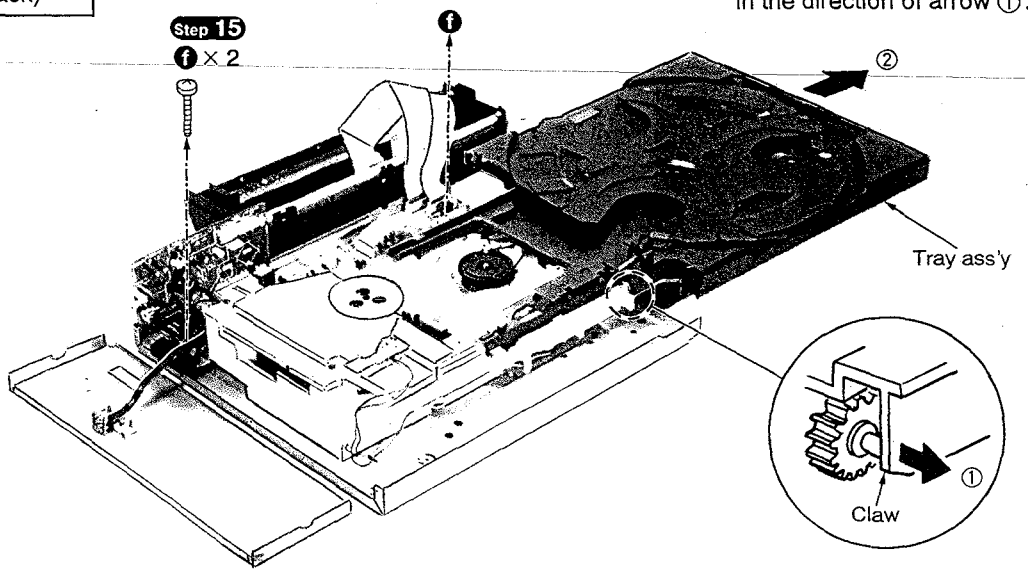


[XTBS3+8JFZ1] (Black)

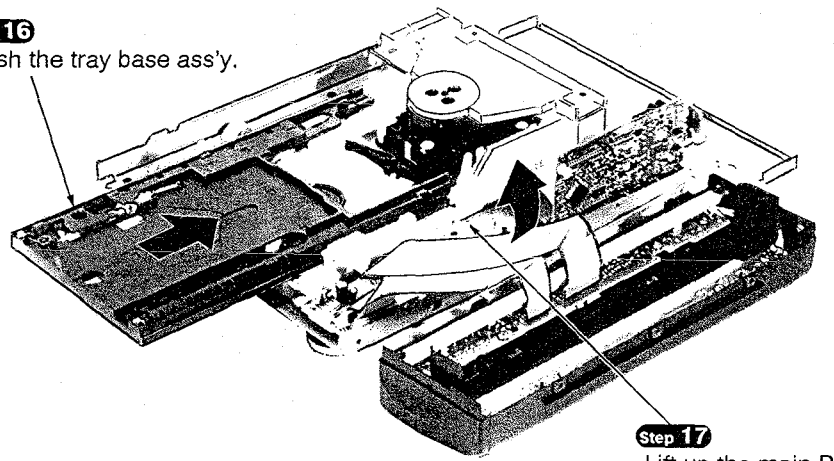
ⓕ [XTB3+16JFZ] (Black)

Step 14
Pull the tray ass'y in the direction of arrow ② with releasing the claw in the direction of arrow ①.

Step 15
ⓕ × 2



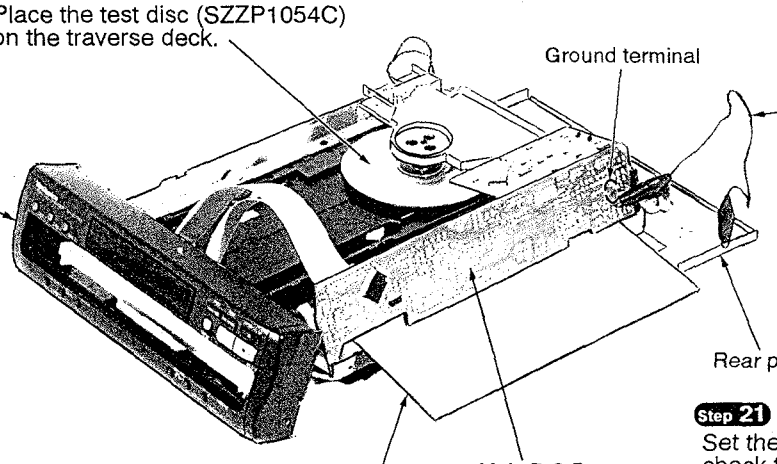
Step 16
Push the tray base ass'y.



Step 17
Lift up the main P.C.B..

Step 20
Place the test disc (SZZP1054C) on the traverse deck.

Step 18
Place the front panel ass'y.



Step 19
Short with lead wire between the ground terminal and the rear panel.

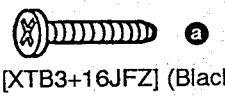
Step 21
Set the service mode **C-2** and check the operation of main P.C.B. (See page 23).

NOTE
Apply power with using power supply tool.

NOTE
Insulate with insulation material to avoid short circuit.

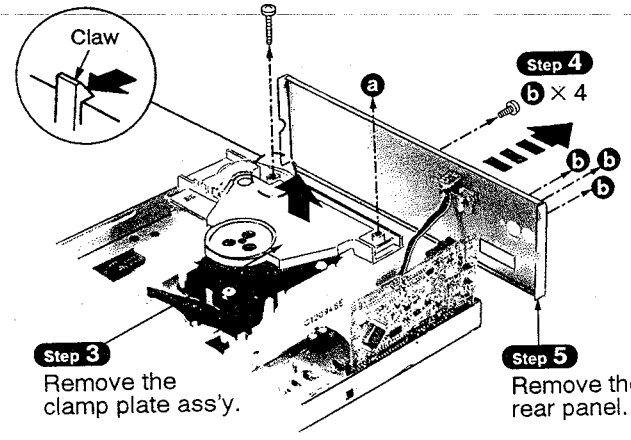
3. Checking for the servo P.C.B.

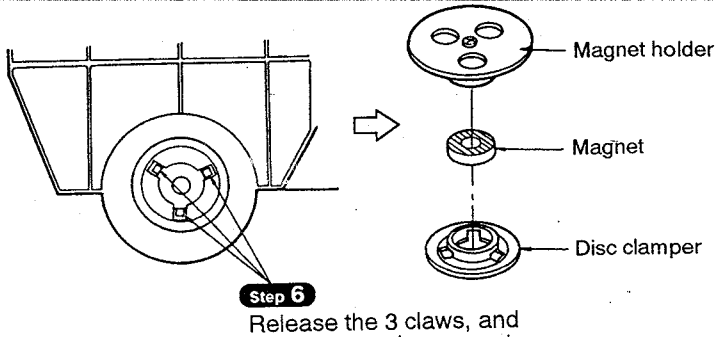
- Follow the item 2 (Step 1 ~ Step 8) on checking procedure for each P.C.B. (See pages 14 and 15).



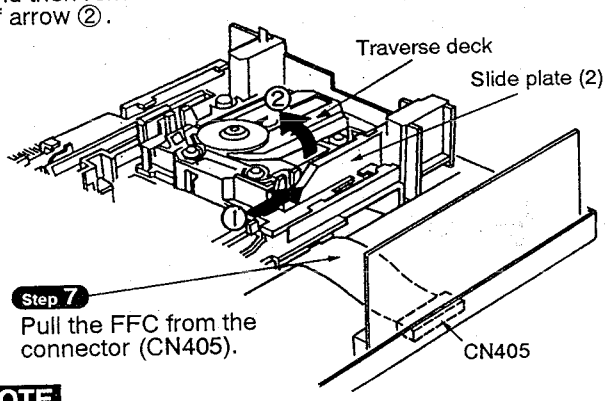
Step 2
Release the claw.

Step 1
a × 2



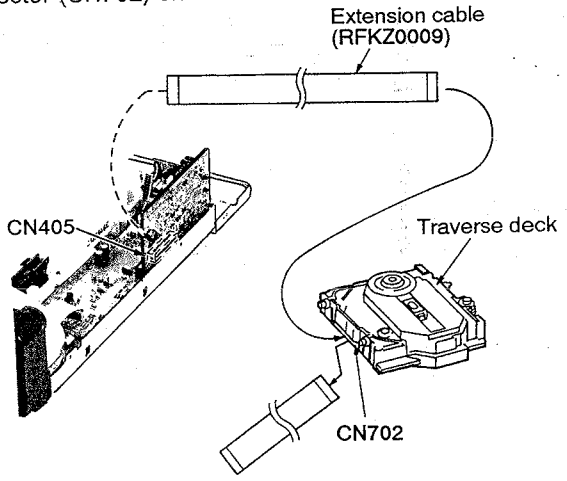


Step 8
Pressing the slide plate (2) in the direction of arrow ①, and then remove the traverse deck in the direction of arrow ②.

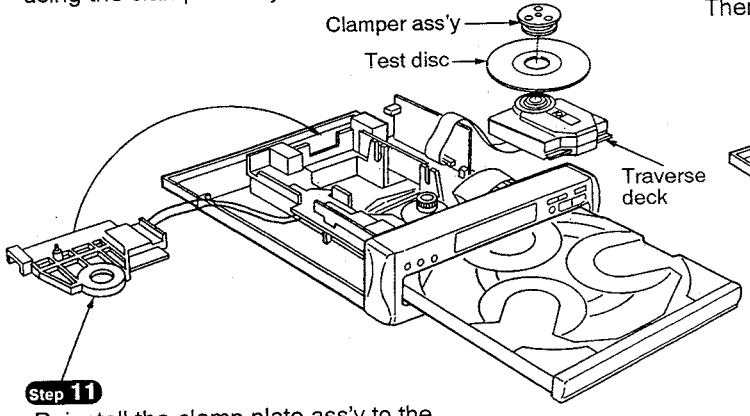


NOTE
When remove the traverse deck, please be careful not to damage the FFC.

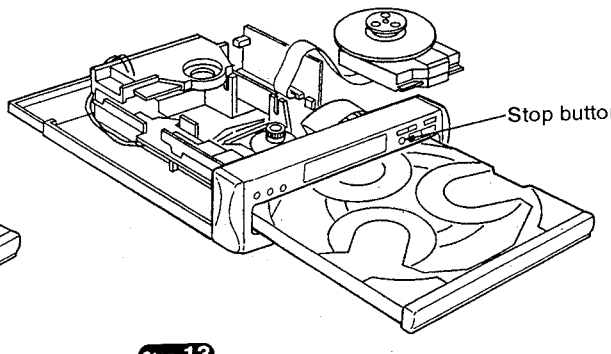
Step 9
Substitute the serviceable extension cable for the FFC between the connector (CN405) on main P.C.B. and the connector (CN702) on servo P.C.B..



Step 10
Place the test disc (SZZP1054C) and secure it by using the clamper ass'y.

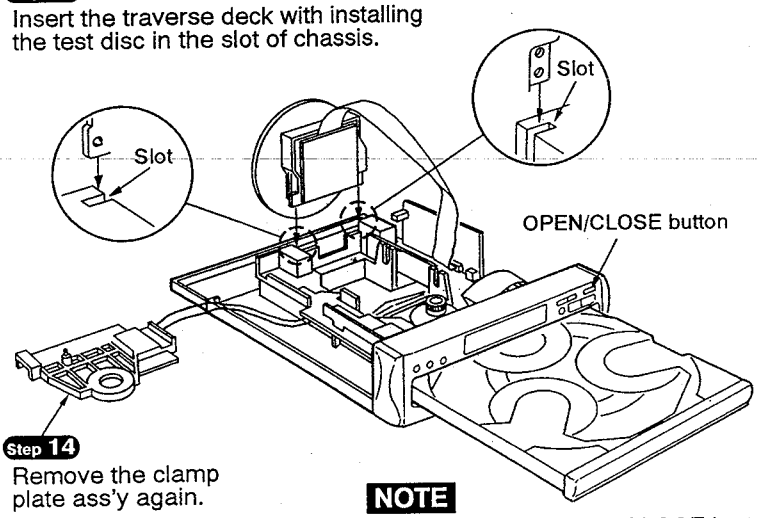


Step 12
Set the service mode C-1, and confirm of function. Then push the stop button. (See page 23).



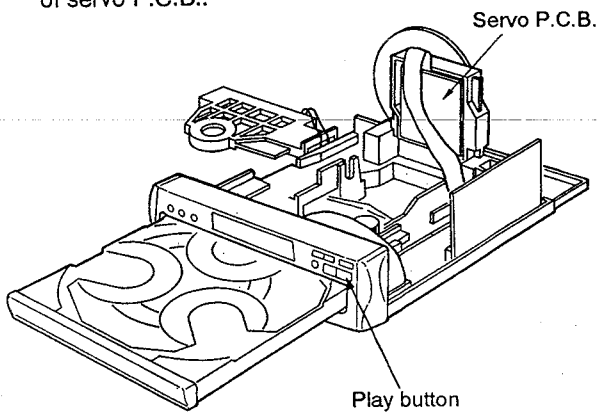
Step 13
After confirmation, push the STOP button.

Step 15
Insert the traverse deck with installing the test disc in the slot of chassis.



Step 14
Remove the clamp plate ass'y again.

Step 16
Pushing the play button check the operation of servo P.C.B..

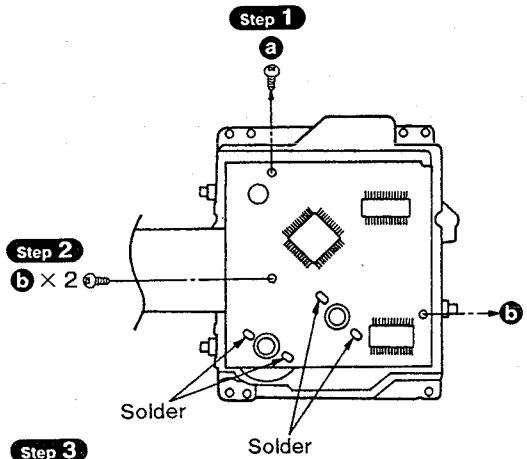


NOTE
Do not push the OPEN/CLOSE button with removing the clamp plate ass'y.

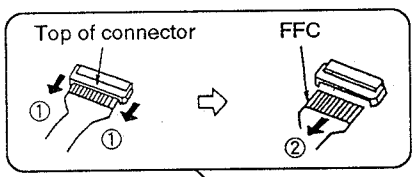
■ Main Component Replacement Procedures

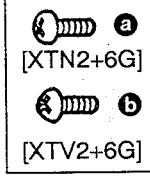
1. Replacement for the traverse deck ass'y

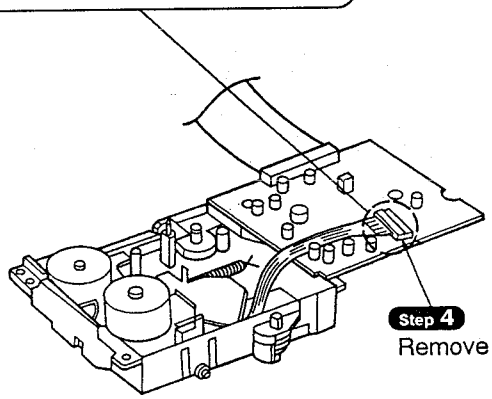
- Follow the item 2 (Step 1 ~ Step 8) on checking procedure for each P.C.B. (See pages 14 and 15).
- Follow the item 3 (Step 1 ~ Step 3 , Step 7 , Step 8) on checking procedure for each P.C.B. (See page 17).



Step 3
Unsolder the spindle motor terminals and traverse motor terminals.

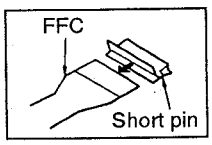




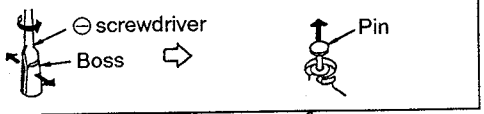


Step 4
Remove the FFC.

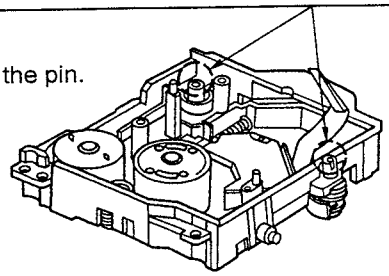
CAUTION
Insert a short pin the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse Deck" on page 12).

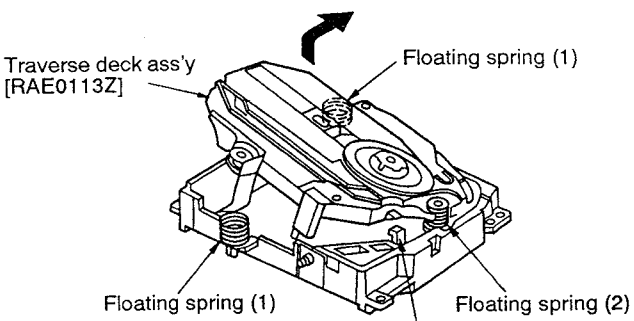


1.Spread the boss with ⊖ screwdriver. 2.Pull out the pin in the direction of arrow.



Step 5
Remove the pin.



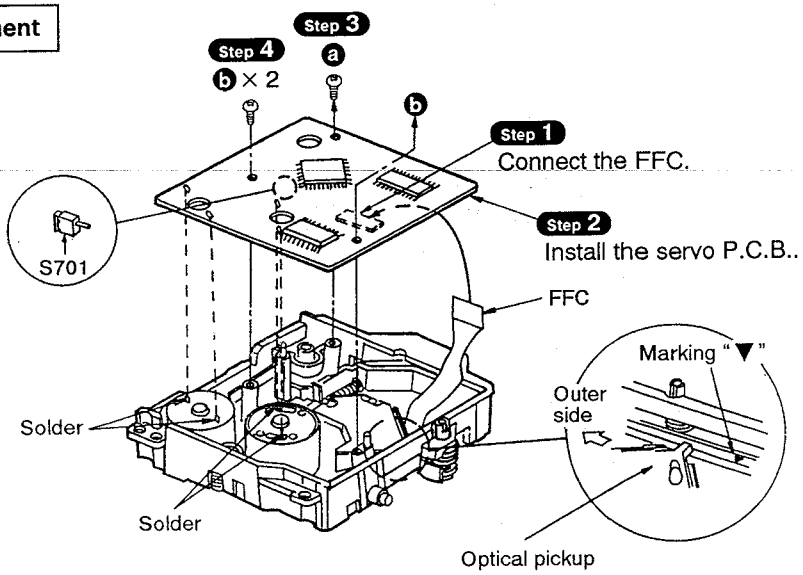


NOTE
Be careful not to lose the 3 springs because those will also be removed on removal of the traverse deck ass'y.

Step 6
Release the claw.

Installation of the servo P.C.B. after replacement

NOTE
Before installing the servo P.C.B., move the optical pickup toward the outer edge from the mark "▼". [Otherwise, the rest detect switch (S701) mounted on the servo P.C.B. may be damaged.]



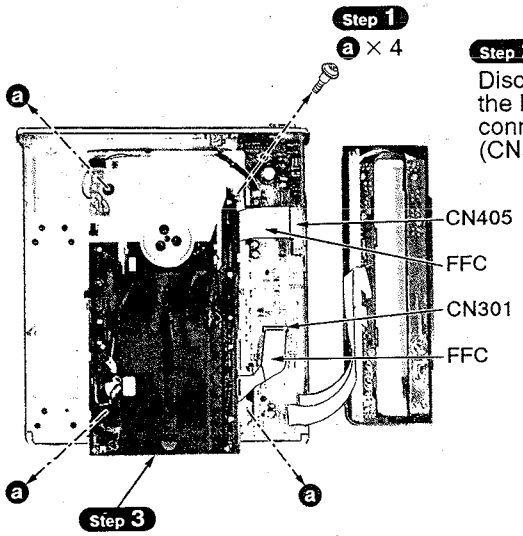
a
[XTN2+6G]
b
[XTV2+6G]

Step 5
Solder each motor terminal.

2. Replacement for the belt, motor ass'y and solenoid

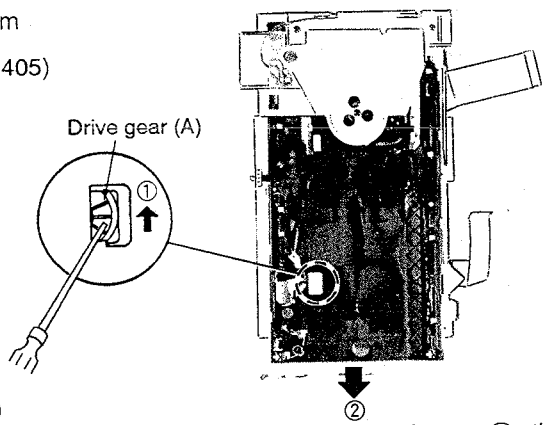
a
[RHD30043]

• Follow the item 2 (Step 1 ~ Step 9 , Step 12 ~ Step 14) on checking procedure for each P.C.B. (See pages 14~16).



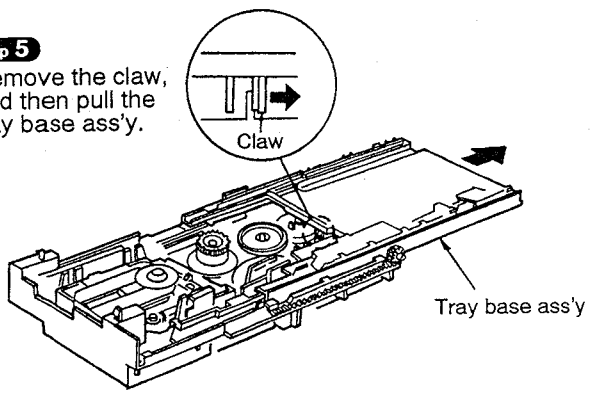
Step 3
Remove the loading unit.

Step 2
Disconnect the FFC from connector (CN301,CN405)

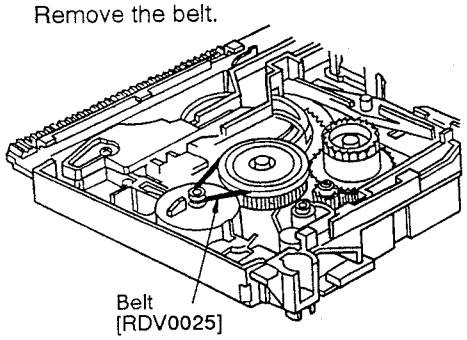


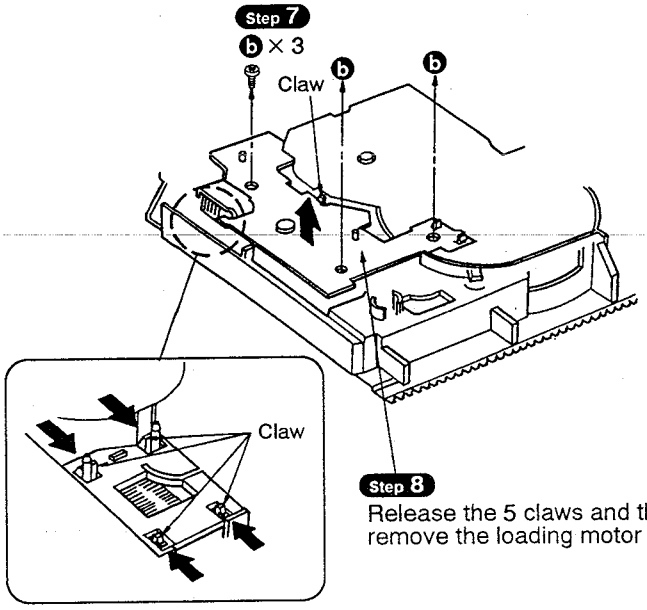
Step 4
Pressing the drive gear (A) in the direction of arrow ①, the tray base ass'y moves slightly in the direction of arrow ②. Then, pull the tray base ass'y in the direction of arrow ②.

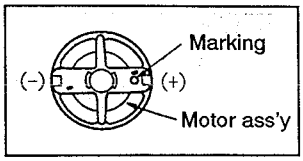
Step 5
Remove the claw, and then pull the tray base ass'y.

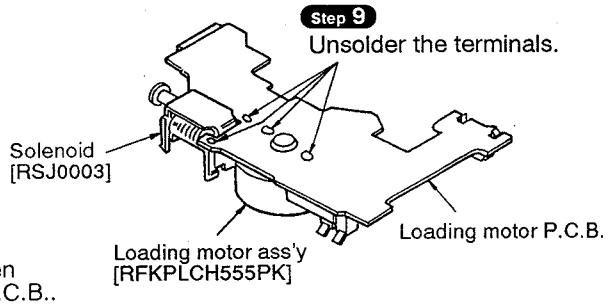


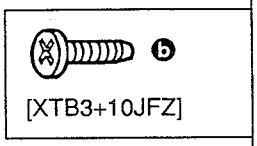
Step 6
Remove the belt.





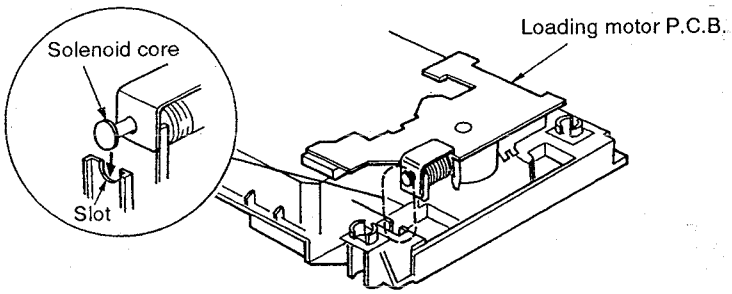






• Notice for installation of loading motor P.C.B..

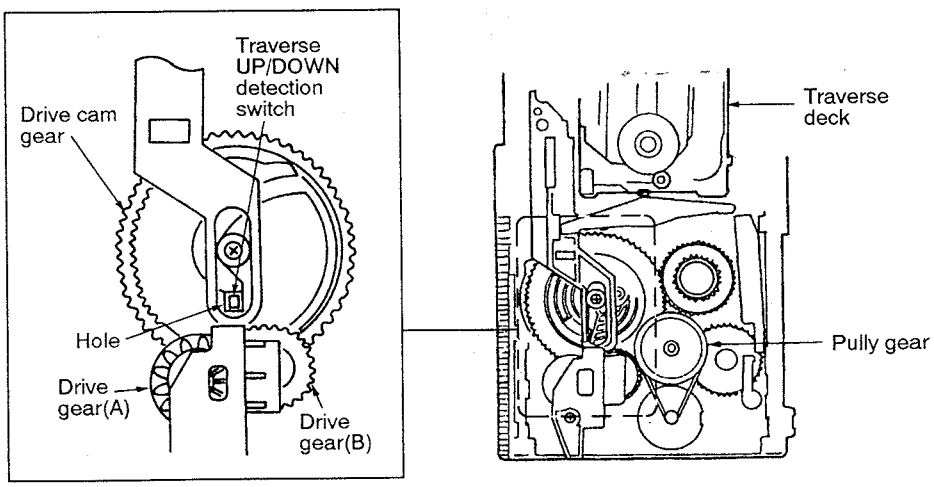
NOTE
Align the slot of lever with the solenoid core.

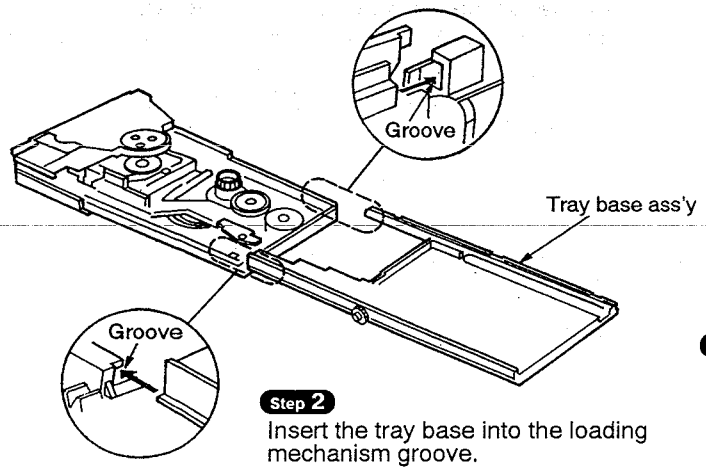


Installation of the tray base ass'y and the tray ass'y after replacement

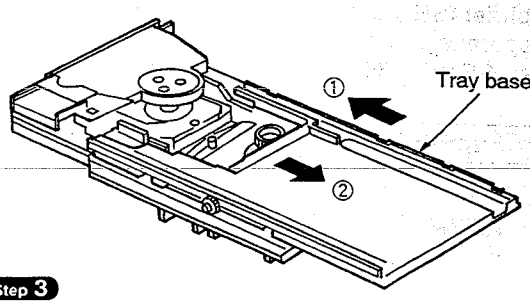
Step 1
When Installing the tray base ass'y and the tray ass'y, place the loading mechanism into the CLOSE/ TRAVERSE DOWN position as follows.

[Check points]
1. The traverse deck should be positioned at the low level.
2. Traverse UP/DOWN detection switch should be at the center position.
3. Mark sure that the two drive gears can be turned freely by hand.

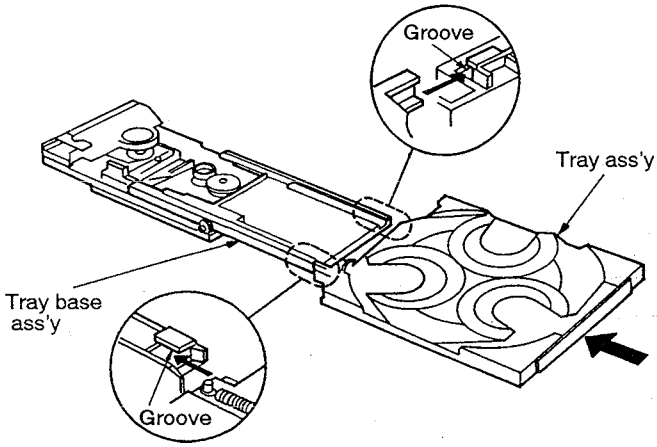




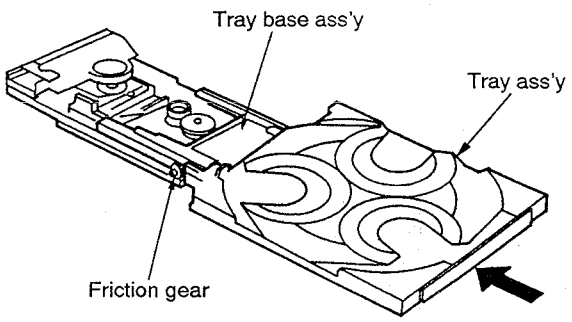
Step 2
Insert the tray base into the loading mechanism groove.



Step 3
Push the tray base ass'y fully in the direction of arrow ① and make sure that tray lock takes place.
Disengage the tray lock and pull out fully in the direction of arrow ②.



Step 4
Insert the tray ass'y to the tray base ass'y with holding the tray base ass'y.



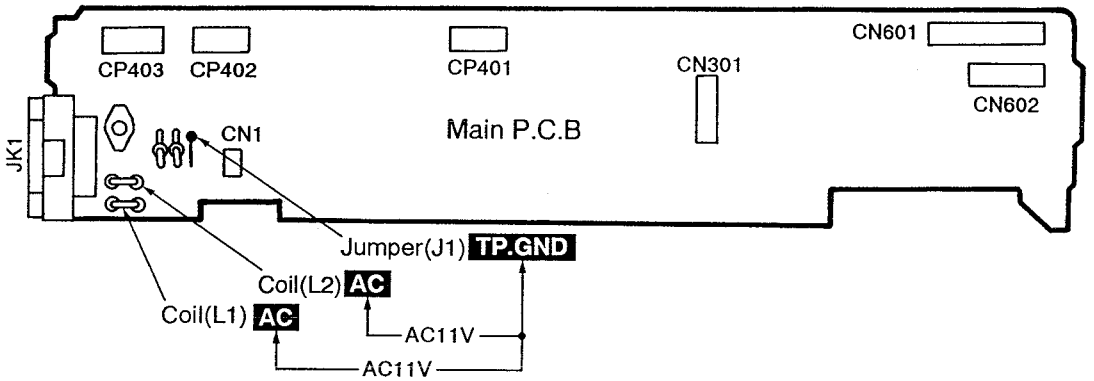
Step 5
After disengaged with the friction gear, push the tray base ass'y and tray ass'y.

■ POWER SUPPLY (POWER SUPPLY TO A SYSTEM)

This Video CD Changer unit (SL-VC1180) is designed to operate on power supplied from the amplifier (SE-VC1180) through the tuner (ST-VC1180). When connecting the unit to other system components, never directly connect it to the amplifier (SE-VC1180). Be sure to connect it through the tuner (ST-VC1180).
When operating the unit (SL-VC1180) independently for testing and maintenance without power supplied from the amplifier (SE-VC1180) and tuner (ST-VC1180), use the following method.

Power Supply to This Unit alone

Apply 11V AC power to the section between AC 11V (AC) of the coil (L1) and the jumper J1 (GND) as well as the section between AC 11V (AC) of the coil (L2) and the jumper J1 (GND). (10V AC power can be also applied when using power supply tool.) (Shown in Fig. 1)



■ BEFORE ADJUSTING AND TESTING CIRCUITS

This unit is equipped with a Service mode capable of locating failures. After testing the unit in the service mode, adjust it and test each individual circuit.

FL Display and Panel Switch Test Mode

Test the FL display and panel switches only by removing the cabinet.

Turn on the power.

↓

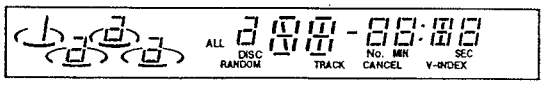
Holding down the [STOP] button for more than 2 seconds, push the [REPEAT] button. This clears the FL display. The unit is now in the Service mode.

↓

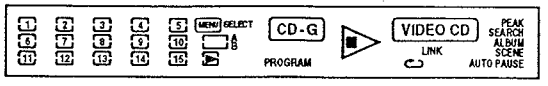
Push all the buttons on the front panel Ass'y of the unit; [DISC 1], [DISC 2], [DISC 3], [AI EDIT], [AUTO PAUSE], [RESUME], [RETURN], [RANDOM] and [REPEAT].

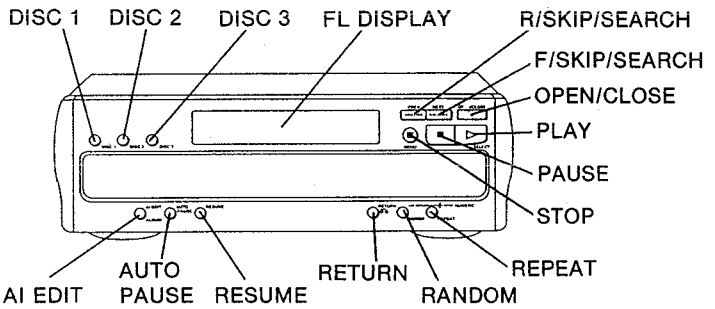
↓

All information on the display should light up.



Each push of the [STOP] button changes the display.





Note: There are two display patterns for this unit.

Push the [OPEN/CLOSE] button.

↓

When the dis tray Ass'y is fully open, "C-F" should appear on the display.

↓

Push the [OPEN/CLOSE] button again to close the disc tray Ass'y.

↓

Turn off the power to exit the Service mode.

Service Mode C-1

Used for servo-circuit testing and mechanical adjustment when the traverse deck is removed from the unit.

Set the unit to Step 12 (See page 17.)

↓

Supply power to the unit.
(For power supply, see page 22).

↓

Holding down the [STOP] button for more than 2 seconds, push the [PLAY] button.

↓

"C-1" should appear on the display and the Rotary tray should rotate. The unit is now in the automatic adjustment results mode.

Notes:

- When the unit alone is turned on, the error code "U-70" first appears. Continue holding the [STOP] button for more than 2 seconds, push the [PLAY] button until it changes to "C-1".
- The "C-1" display allows the [STOP], [PLAY] and [SKIP/SEARCH] buttons to function.

↓

The automatic adjustment results codes appear on the display. "E-00" indicates that the servo-circuit is functioning normally. For other codes, see page 26. These codes are the basis for locating failures In the servo-circuit.

↓

Remove the test disc from the unit and turn the power off. (This clears the automatic adjustment results mode.)

* Before beginning, check to see that the test disc and optical pickup lens are free from defects such as scratches and stains.

Service Mode C-2

Used for main circuit testing when the disc tray is removed from the unit (the traverse deck remains in place).

Set the unit to Step 21. (See page 16.)

↓

Supply power to the unit.
(For power supply, see page 22.)

↓

Holding down the [STOP] button for more than 2 seconds, push the [R. SKIP/SEARCH] button.

↓

"C-2" should appear on the display, the traverse deck ascend and the Rotary tray rotate. The unit is now in automatic adjustment results mode.

Notes:

- When the unit alone is turned on, the error code "U-70" first appears. Continue holding the [STOP] button for more than 2 seconds, push the [R. SKIP/SEARCH] button until it changes to "C-2". "C-2" allows the [STOP], [PLAY], [SKIP/SEARCH] and [OPEN/CLOSE] buttons to function. However, the disc tray will only open half way if the [OPEN/CLOSE] button is pressed.

↓

The automatic adjustment results codes should appear on the display. "E-00" indicates that the servo-circuit is functioning normally. For other codes, see page 26.
These codes are the basis for locating failures in the servo-circut.

↓

Ture off the unit, and then back on. (This causes the traverse deck to descend.)

↓

Remove the test disc turn the unit off. (This clears the automatic adjustment results mode.)

* Before beginning, check to see that the test disc and optical pickup lens are free from defects such as scratches and stains.

■ ABOUT THE SELF-DIAGNOSTIC MODE

This unit is equipped with a self-diagnostic function which, in the event of a malfunction, automatically displays a code indicating the nature of the malfunction. Use this self-diagnostic function when servicing the unit.

SC-VC1180 (SL-VC1180, ST-VC1180, SE-VC1180, RS-CA1060, SB-CA1080)

Display method	Display location

To display the malfunction code

U-70:..... Automatically displays on the tuner and the video CD changer when a malfunction occurs.
F16~F25:..... Displays on the video CD changer using the procedure described below.
F-61:..... Automatically displays on the tuner when a malfunction occurs.

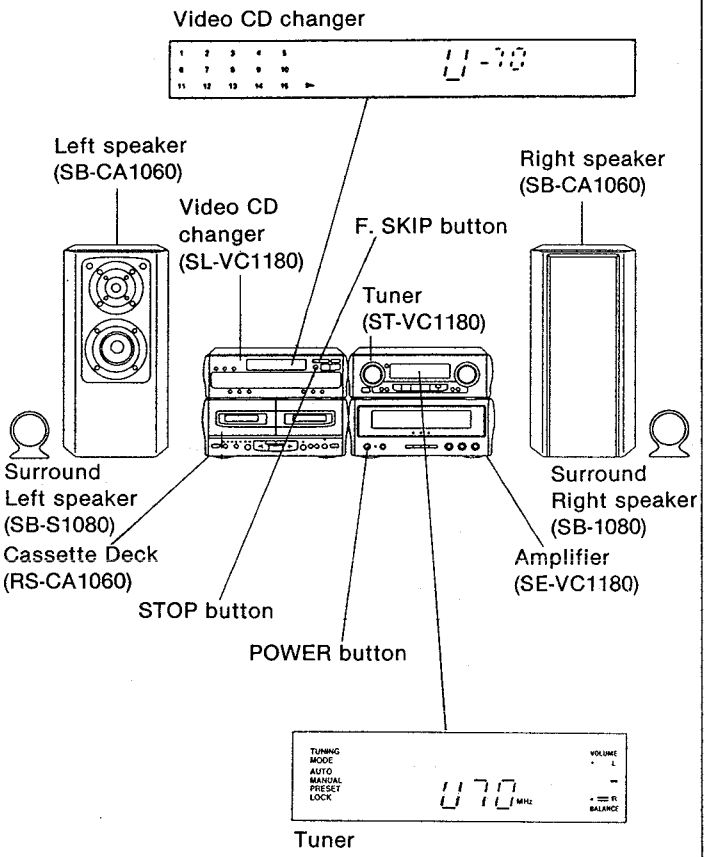
- **Display procedure**

1. Switch on the power to the unit (SL-VC1180). Connect the system and press the POWER button on the amplifier (SE-VC1180).
2. While pressing the STOP button for at least 2 seconds, press the F. SKIP button. The self-diagnostic mode will be activated.

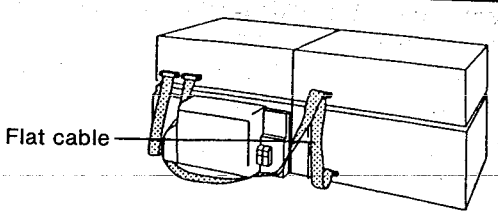
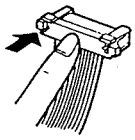
If there is a malfunction, the above operation will cause the malfunction code (F16~F25) to be displayed.
Note: There may be more than one malfunction at the same time, so after correction the first malfunction displayed, repeat the procedure above [steps (1) and (2)] to confirm that no other malfunction is displayed.
If there is not other malfunction, "END" is displayed, the disc tray will half-eject, full-eject, and then close.

To return to the normal display

1. **For U-70:**
   - Press an operation button (any button other than the OPEN/CLOSE button) on the unit (tuner or video CD changer) which displayed "U-70".
   - To re-display the code, switch the power off (POWER STANDBY button), and then switch power back on again.
2. **For F16~F25:**
   - Switch off the power (POWER STANDBY button).
   - To re-display the code, switch the power on (POWER STANDBY button) and then repeat the procedure above (step 1 and 2).
3. **For F-61:**
   - If "F-61" is displayed, the power will automatically be switched off and the standby indicator will light up.
   - "F-61" will be displayed for 3 seconds, and then the clock will be displayed.
   - To re-display the code, switch the power on. "F-61" will be re-displayed, and then after 3 seconds the clock will be displayed and the power will automatically switch off.



• Display contents

Display code	Problem or condition	Correction procedure
U-70 (displayed automatically)	A bus-line communications error has occurred as a result of the flat cables being inserted incorrectly, thus preventing the system from operating. 1. If "U-70" is displayed on the tuner, the cassette deck cannot be operated by remote control. 2. If "U-70" is displayed on the video CD changer, the video CD changer cannot be operated by remote control.	 1. To check for correct insertion of the flat cables ① Match each connector with the color (black/white of the connection port and insert until you hear a click. ② Insert the flat cables at the back of the unit in the order indicated. Make sure the which side of the cable is on your right side.  2. Breakage of flat cable (Check and replace as necessary.) 3. If the problem is not corrected by items (1.) and (2.) above, this indicates a faulty IC. SL-VC1180 IC301 (M38174M8272F) IC302 (LA5608M-TE-L) Check these ICs and replace as necessary.
F16	Faulty traverse deck UP switch. Example: The rotary tray hits the traverse deck.	1. Check for faulty contact of the switch (S501), faulty soldering of switch terminals, and damaged foil. 2. Replace the switch, repair soldering or repair foil.
F17	Faulty traverse deck DOWN switch. Example: The tray ass'y opens.	1. Check for faulty contact of the switch (S501), faulty soldering of switch terminals, and damaged foil, etc. 2. Replace the switch repair soldering or repair foil.
F18	Faulty rotary tray rotation detection. Example: The tray continues to turn at the initial position without stopping.	1. Check the optical sensor (D503) and replace if necessary.
F20	Faulty loading motor rotation detection. Example: The tray repeatedly rotates in forward or reverse direction, or tray ass'y repeatedly moves out and back in.	1. Check the optical sensor (D502) and replace if necessary.
F21	Loading motor rotates in reverse. Example: The tray repeatedly rotates in forward or reverse direction, or tray ass'y repeatedly moves out and back in.	1. Check the mounting direction of the motor (M501), and if the direction is reversed, re-mount it in the correct direction.
F22	Faulty loading motor and loading mechanism. Example: Nothing happens when the PLAY button is pressed. The loading operation is not performed when the OPEN/CLOSE button is pressed.	1. Check the motor (M501) and replace if necessary. Check the cams and other of the loading mechanism to confirm that none are damaged or missing, and that all are mounted in the correct positions.
F24	Faulty half-open switch. Example: When the tray ass'y is opened during play, it opens completely (full open).	1. Check for faulty switch contacts (S502), faulty soldering of switch terminals, and damaged foil. 2. Replace the switch, repair soldering or repair foil.
F25	Faulty full-open switch. Example: When the tray ass'y is opened, it closes after 3 or 4 seconds.	1. Check for faulty switch contacts (S503), faulty soldering of switch terminals, and damaged foil. 2. Replace the switch, repair soldering or repair foil.
F-61	When the power switch is switched on, it automatically switches back off, making it impossible to switch power on.	1. Faulty amplifier SE-VC1180 Power Amp (IC501). 2. Fan motor is burnt out, locked, or stopped. 3. Replace the Power Amp or fan motor as necessary.

■ AUTOMATIC ADJUSTMENT RESULTS DISPLAY FUNCTION

(SELF-CHECK FUNCTION)

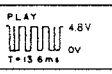
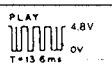
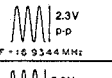
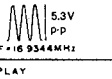
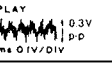
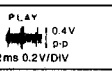
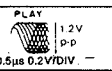
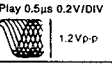
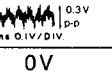
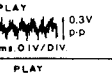
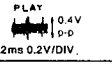
The SL-VC1180 unit has a function that uses the FL display board to indicate the results from automatic adjustment of the servo-circuit (tracking, focus, offset, etc.) as error codes.
The error code display indicates the location of failures from automatic adjustment circuit.
The following procedure displays the error codes from the self-diagnostic function.

• Procedures for displaying automatic adjustment codes

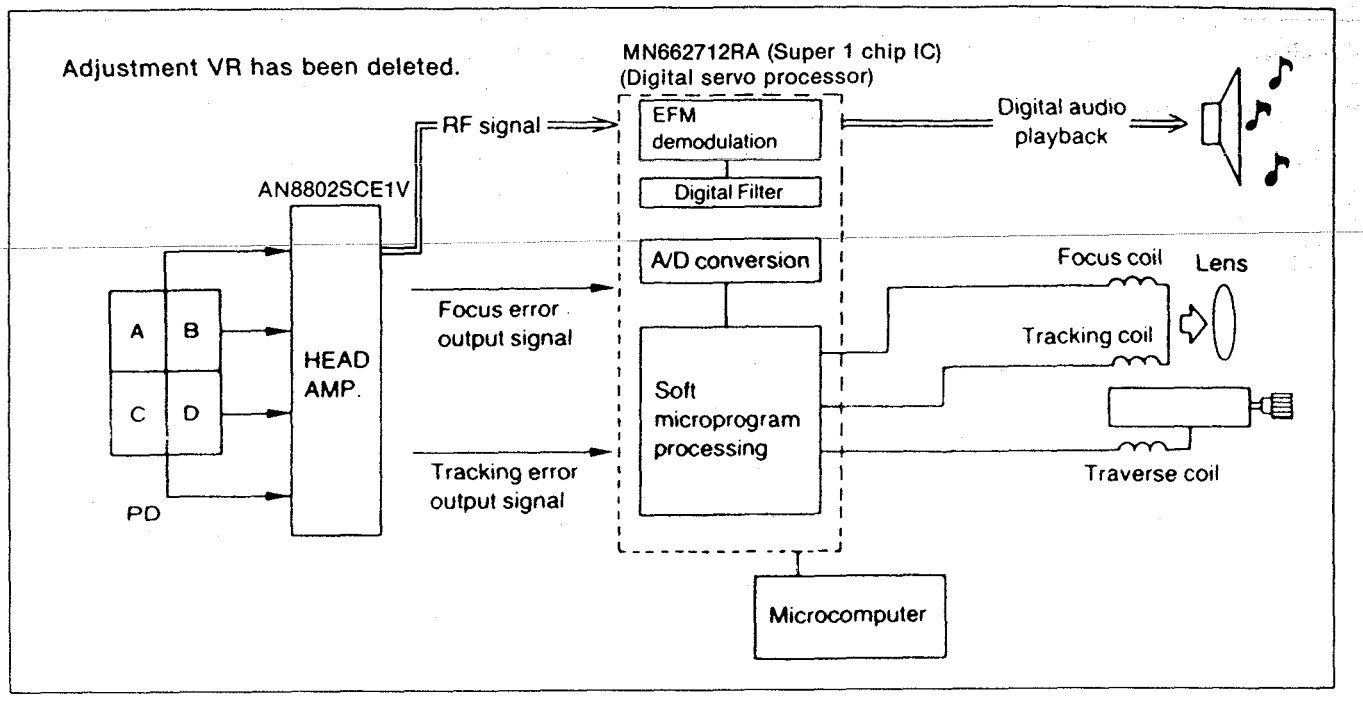
1. Set the unit in the servo-board testing mode (refer to page 17).
2. Turn on the power to the unit.
   Note:
   When the SL-VC1180 unit is powered on, the error code "U-70" is displayed. Exit this mode using the STOP (□) key.
3. Check one of the disc trays in the rotary tray faces the front.
4. Hold down the STOP (□) key for more than two seconds and press the R. SKIP (I◀◀/◀◀) key. This causes the unit to enter the automatic adjustment mode.
5. After automatic adjustment, the code display indicates the location of failure in the servo circuit.

• Error code based troubleshooting

※ The unit is satisfactory if the error code is **E-0**.
※ Before testing, check that the test disc is free of scratches and dirt and optical pickup is clean.

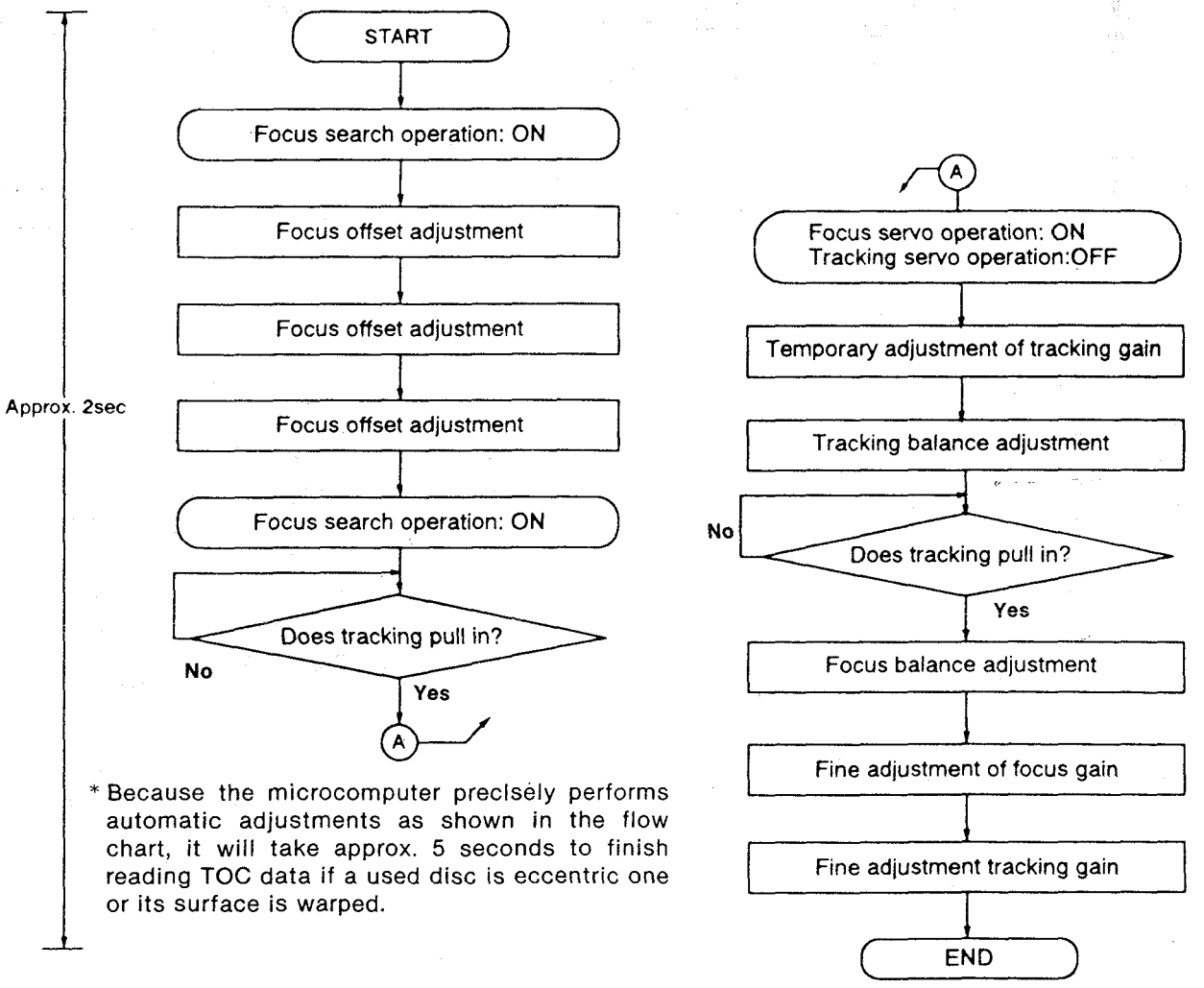
FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Signal name	Location	PLAY	STOP
E-1	Focus and tracking offset adjustments not completed in specified time period.	① Clocks X1 and X2, power supply V_{DD}, and reset/RST, all on IC702 ② MDATA, MCLK, MLD, and SENSE signals to/from mechanism controller	MDATA	IC702 ⑧ pin		4.8V
			MCLK	IC702 ⑦ pin		4.8V
			MLD	IC702 ⑨ pin		
			SENSE	IC702 ⑩ pin	0V	0V
			/RST	IC702 ⑱ pin	4.9V	4.9V
			X1	IC702 ⑱ pin		
			X2	IC702 ⑲ pin		
E-3 E-5 E-7 E-9 E-B E-D E-F	Disc play unstable	① Scratches or contaminants on disc surface ② Focus and tracking servo circuits (check waveforms, voltages, and part values.) ③ Spindle driver circuit ④ Optical pickup	FE	IC702 ㉜ pin		2.4V
			TE	IC702 ㉝ pin		2.4V
			FOD	IC702 ㉘ pin	2.4V	2.4V
			TRD	IC702 ㉗ pin	2.4V	2.4V
			KICK	IC702 ㉖ pin	2.4V	2.4V
			/FLOCK	IC702 ⑪ pin	0V	4.9V
			/RF DET	IC702 ㊳ pin	0V	4.8V
			RF	TJ701		1.5V
			STAT	IC702 ⑰ pin	3.5V	0V
E-4 E-6 E-C E-E	Best "Eye" (PD Balance) adjustment not completed in specified time period.	① Scratches or contaminants on disc surface ② Focus and Tracking servo circuit (check waveforms, voltages, and part values.) ③ Optical pickup	FBAL	IC702 ㉚ pin	2.5±1.25V	2.5±1.25V
			RF	TJ701		1.5V
			FE	IC702 ㉜ pin		0V
			/TLOCK	IC702 ⑫ pin	0V	0V
			OFT	IC702 ㊱ pin	0V	0V
E-8 E-A	Focus or Tracking gain adjustment not completed in specified time period.	① Scratches or contaminants on disc surface ② Focus and Tracking servo circuit (check waveforms, voltages, and part values.) ③ Optical pickup	FE	IC702 ㉜ pin		2.4V
			TE	IC702 ㉝ pin		2.4V
			/TLOCK	IC702 ⑫ pin	0V	0V
			OFT	IC702 ㊱ pin	0V	0V

■ DIGITAL SERVO SYSTEM



The following flow chart shows the sequence of automatic adjustments.

• Flow chart automatic adjustment sequence



* Because the microcomputer precisely performs automatic adjustments as shown in the flow chart, it will take approx. 5 seconds to finish reading TOC data if a used disc is eccentric one or its surface is warped.

■ MEASUREMENTS AND ADJUSTMENTS

Warning: This product uses a laser diode. Refer to caution statements on page 3.

Measuring Instruments and Special Tools

* Test discs
1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

* Musical program disc (ordinary)
* Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1:1 probe).
* Allen wrench (M2.0) (SZZP1101C)
* Lock paint (RZZ0L01)

PREPARATION

Set the service mode **C-1**, and check the Servo P.C.B. (Refer to page 23.)

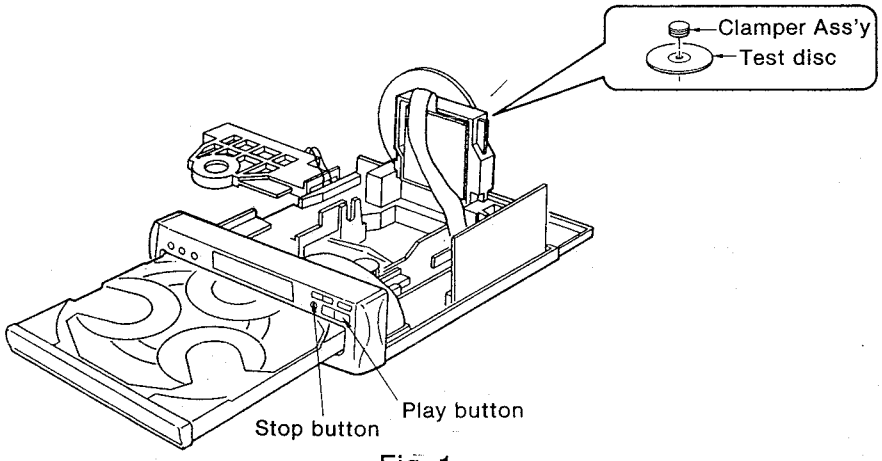


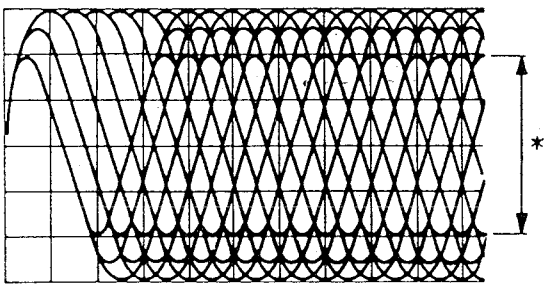
Fig. 1

NOTE

Do not push the OPEN/CLOSE button with removing the clamp plate ass'y.

(1) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ701** (RF) and **TJ702** (VREF) on the servo P.C.B. (Refer to Fig. 3)
   Oscilloscope setting: VOLT 200mV
   SWEEP..... 0.5µs.
   Input coupling..... AC
2. Switch the player power **ON**, and play track **19** on the test disc (SZZP1056C).
   (Playing any other track will prevent the HEX screws from being accessed.)
3. Leave the player in play mode and place it as shown Fig. 3.
4. Alternately adjust the two HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 2)
5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



*Most streched eye pattern.

Fig. 2

(2) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* Checking Skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

* Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* Checking Playability

1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

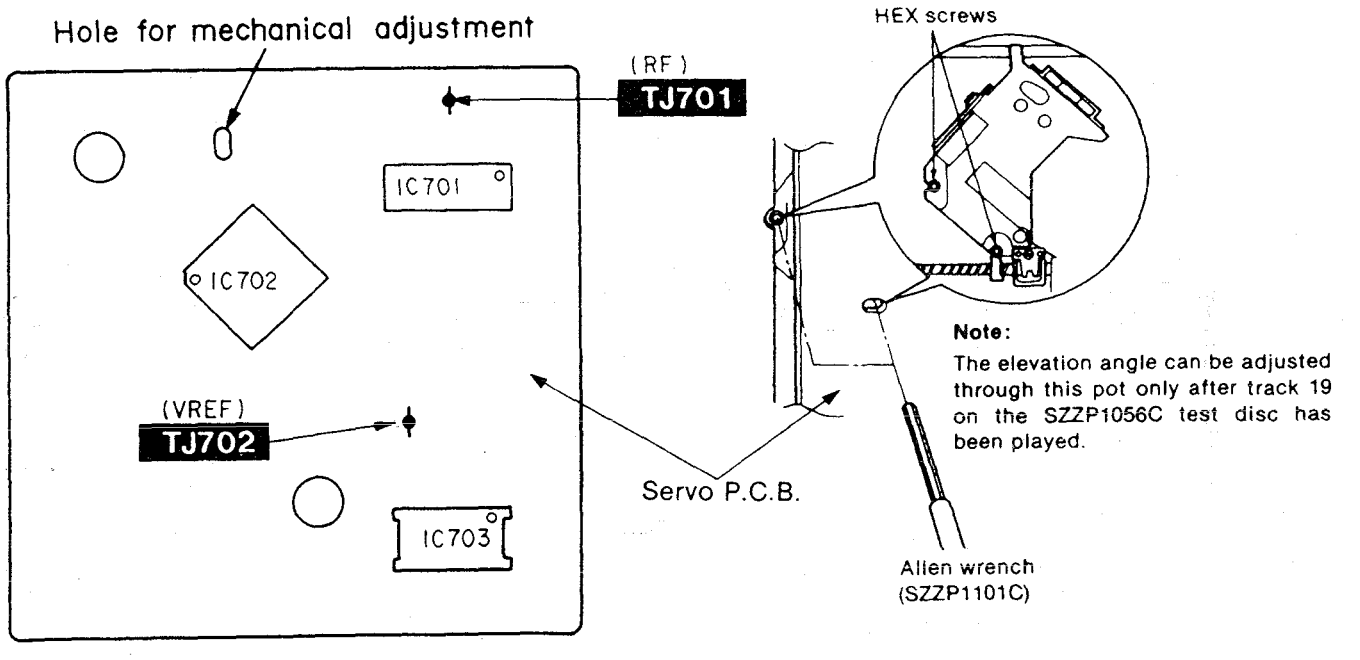
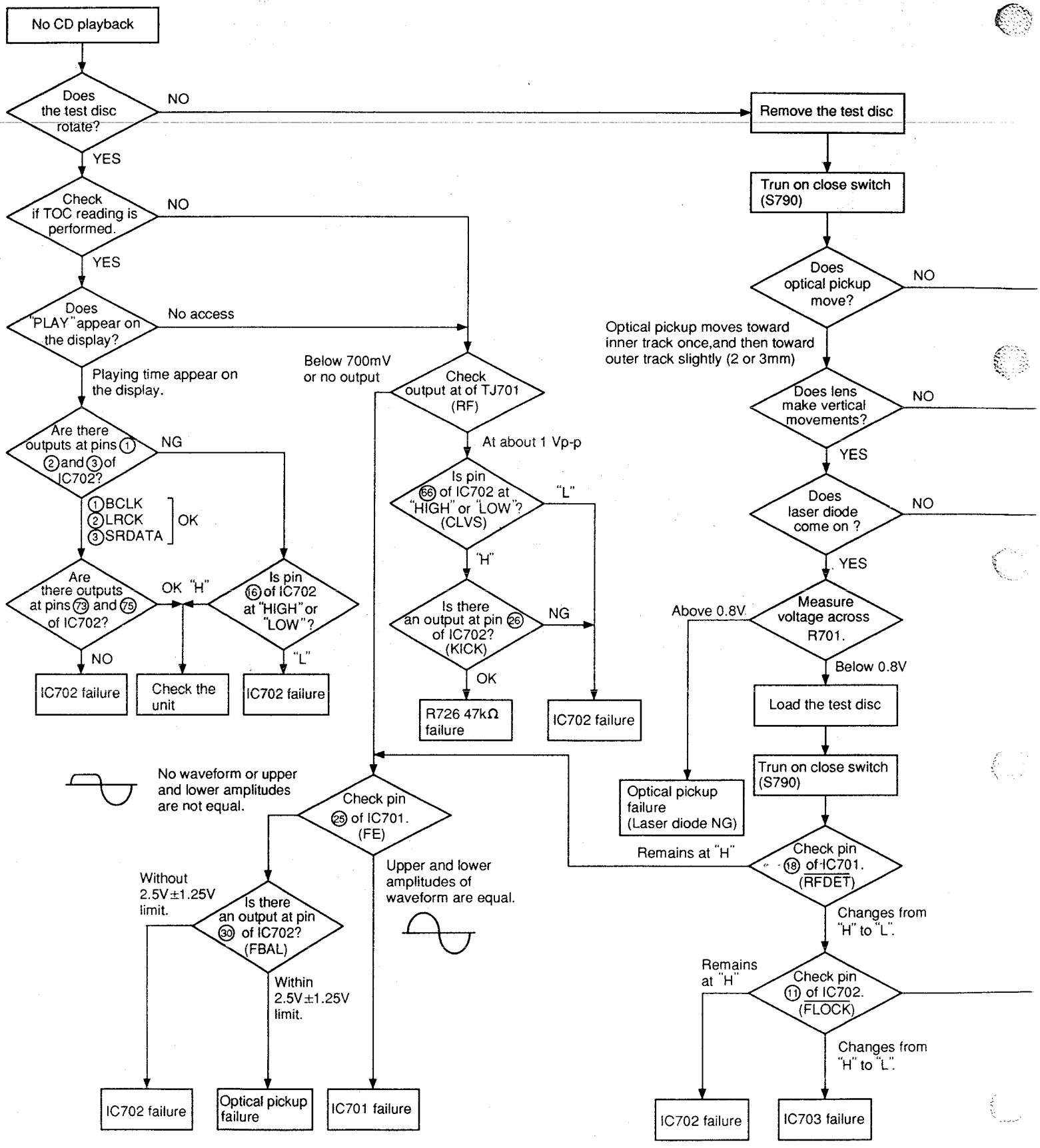
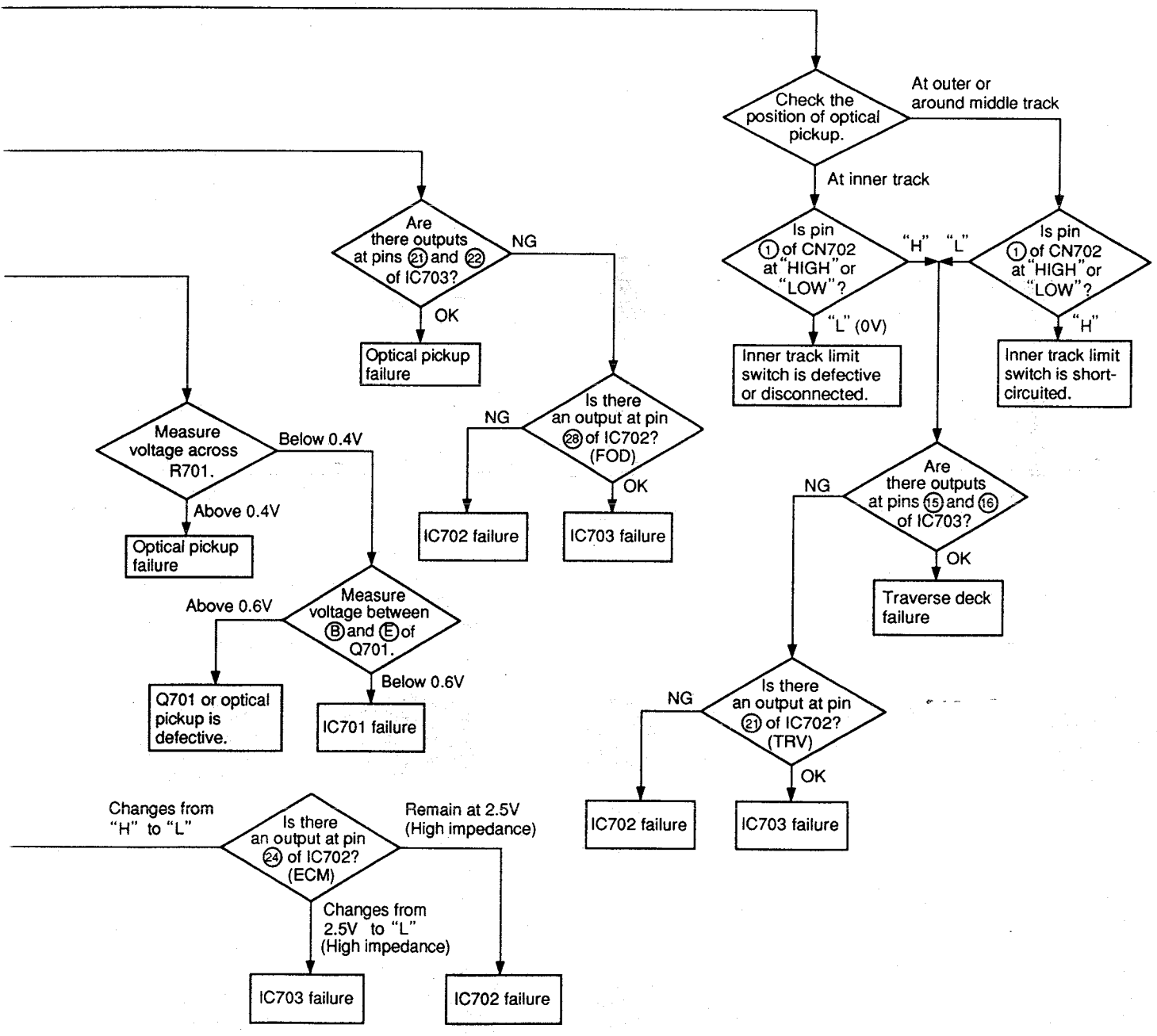


Fig. 3

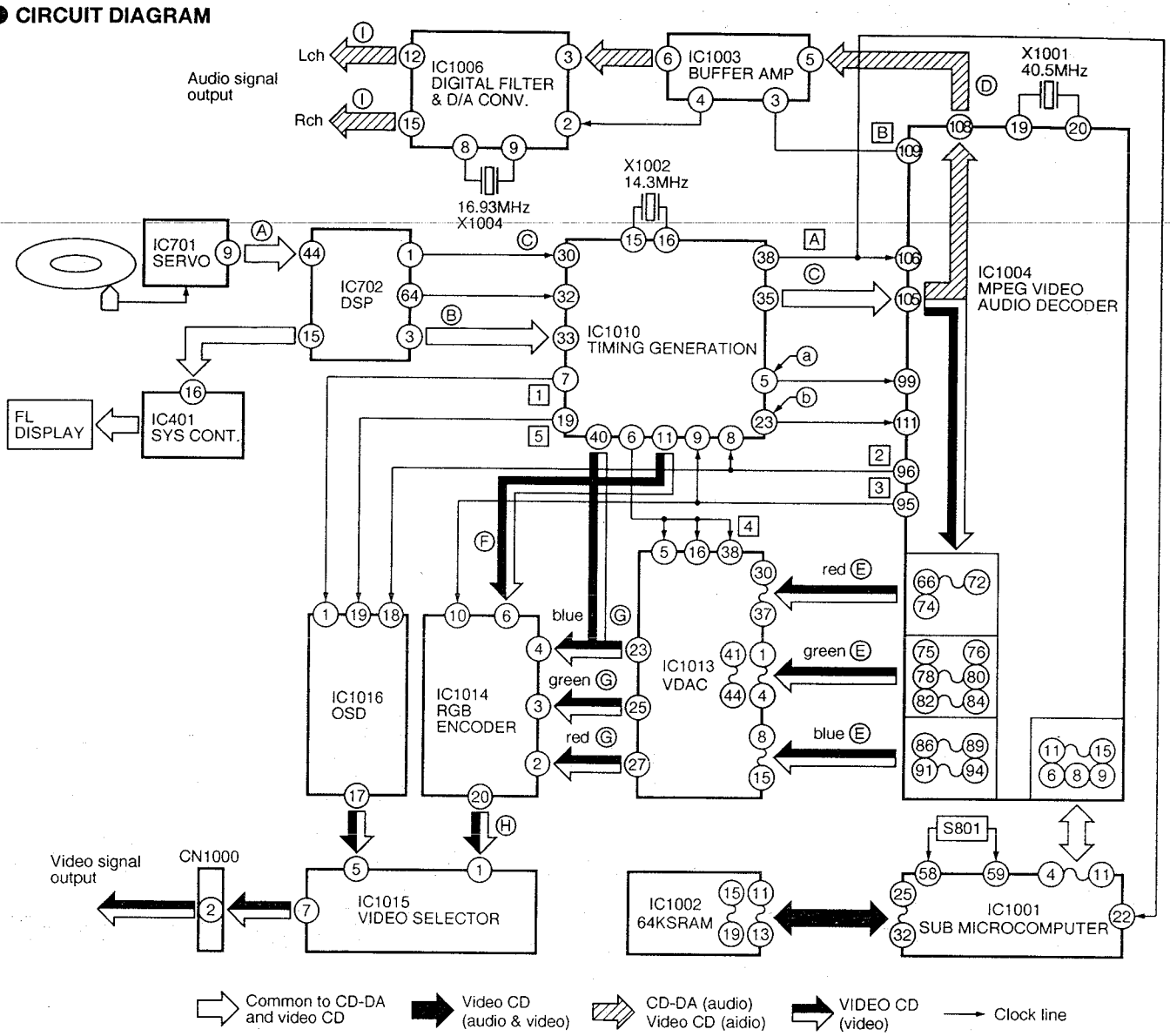
■ TROUBLESHOOTING GUIDE (SERVO CIRCUIT)


No CD playback
Does the test disc rotate?
NO
YES
Remove the test disc
Trun on close switch (S790)
Does optical pickup move?
NO
Optical pickup moves toward inner track once,and then toward outer track slightly (2 or 3mm)
Check if TOC reading is performed.
NO
YES
Does "PLAY" appear on the display?
No access
Playing time appear on the display.
Below 700mV or no output
Check output at of TJ701 (RF)
At about 1 Vp-p
Does lens make vertical movements?
NO
YES
Are there outputs at pins ① ② and ③ of IC702?
NG
①BCLK ②LRCK ③SRDATA
OK
Is pin ⑯ of IC702 at "HIGH" or "LOW"? (CLVS)
"L"
"H"
Does laser diode come on ?
NO
YES
Are there outputs at pins ⑬ and ⑮ of IC702?
OK "H"
Is pin ⑯ of IC702 at "HIGH" or "LOW"?
Is there an output at pin ㉖ of IC702? (KICK)
NG
Above 0.8V
Measure voltage across R701.
Below 0.8V
NO
"L"
OK
IC702 failure
Check the unit
IC702 failure
R726 47kΩ failure
IC702 failure
Load the test disc
Trun on close switch (S790)
Optical pickup failure (Laser diode NG)
No waveform or upper and lower amplitudes are not equal.
Check pin ㉕ of IC701. (FE)
Remains at "H"
Check pin ⑱ of IC701. (RFDET)
Changes from "H" to "L".
Upper and lower amplitudes of waveform are equal.
Without 2.5V±1.25V limit.
Is there an output at pin ㉚ of IC702? (FBAL)
Within 2.5V±1.25V limit.
Remains at "H"
Check pin ⑪ of IC702. (FLOCK)
Changes from "H" to "L".
IC702 failure
Optical pickup failure
IC701 failure
IC702 failure
IC703 failure

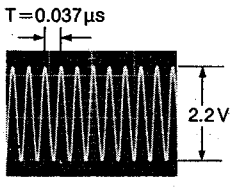
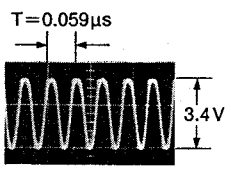
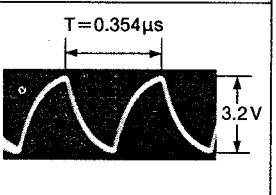

Check the position of optical pickup.
At outer or around middle track
At inner track
Is pin ① of CN702 at "HIGH" or "LOW"?
"H"
"L"
Is pin ① of CN702 at "HIGH" or "LOW"?
"L" (0V)
"H"
Inner track limit switch is defective or disconnected.
Inner track limit switch is short-circuited.
Are there outputs at pins ㉑ and ㉒ of IC703?
NG
OK
Optical pickup failure
Is there an output at pin ㉘ of IC702? (FOD)
NG
OK
IC702 failure
IC703 failure
Measure voltage across R701.
Below 0.4V
Above 0.4V
Optical pickup failure
Measure voltage between Ⓑ and Ⓔ of Q701.
Above 0.6V
Below 0.6V
Q701 or optical pickup is defective.
IC701 failure
Are there outputs at pins ⑮ and ⑯ of IC703?
NG
OK
Traverse deck failure
Is there an output at pin ㉑ of IC702? (TRV)
NG
OK
IC702 failure
IC703 failure
Changes from "H" to "L"
Is there an output at pin ㉔ of IC702? (ECM)
Remain at 2.5V (High impedance)
Changes from 2.5V to "L" (High impedance)
IC703 failure
IC702 failure

TROUBLESHOOTING (VIDEO CIRCUIT)

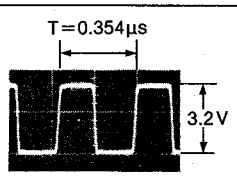
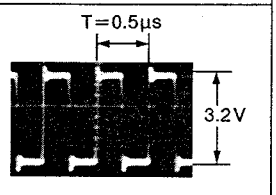
CIRCUIT DIAGRAM



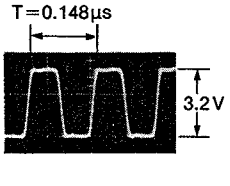
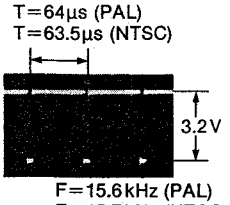
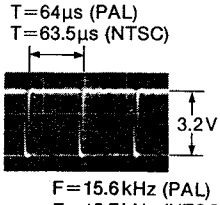
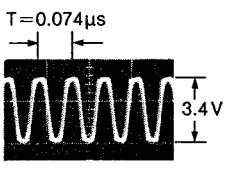
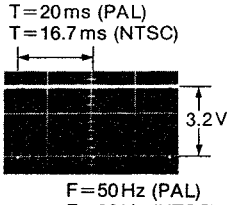
MASTER CLOCK SYSTEM WAVEFORM

ⓐ Video read clock	ⓑ Audio read clock	ⓒ Write reference clock
		
T=0.037µs, 2.2V	T=0.059µs, 3.4V	T=0.354µs, 3.2V
F=27MHz	F=16.9344MHz	F=2.822MHz

AUDIO DATA CLOCK SYSTEM WAVEFORM

Ⓐ CD bit clock	Ⓑ Audio bit clock
	
T=0.354µs, 3.2V	T=0.5µs, 3.2V
F=2.822MHz	F=2MHz

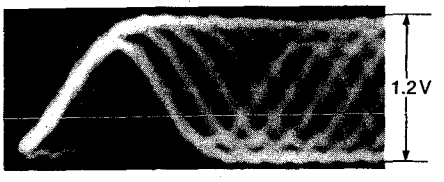
VIDEO DATA CLOCK SYSTEM WAVEFORM

[1] Character display clock	[2] Horizontal sync. clock	[3] Composite sync. clock	[4] Pixel clock	[5] Vertical sync. clock
				
T=0.148µs, 3.2V	T=64µs (PAL) T=63.5µs (NTSC), 3.2V	T=64µs (PAL) T=63.5µs (NTSC), 3.2V	T=0.074µs, 3.4V	T=20ms (PAL) T=16.7ms (NTSC), 3.2V
F=6.75MHz	F=15.6kHz (PAL) F=15.7kHz (NTSC)	F=15.6kHz (PAL) F=15.7kHz (NTSC)	F=13.5MHz	F=50Hz (PAL) F=60Hz (NTSC)

DATA SIGNAL LINE WAVEFORMS

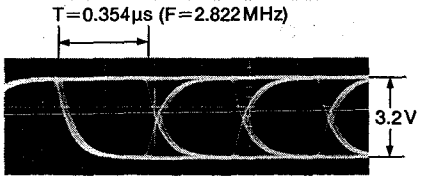
Note: Use the PVCD_K06 video CD test disc (menu playback feature is available on version 2.0). For color bar display, play back the 1st track when the menu playback feature is used, or the 3rd track when the feature is not used.

Ⓐ IC701 ⑨ RF signal



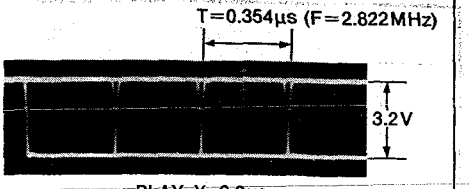
PLAY X: 0.5µs
Y: 0.05V × 10

Ⓑ IC1010 ㊸ CD serial data input



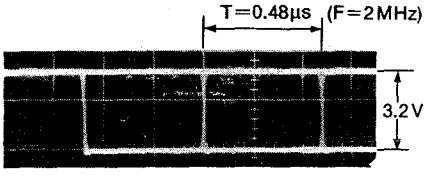
PLAY X: 0.2µs
Y: 0.2V × 10

Ⓒ IC1010 ㊺ CD serial data output



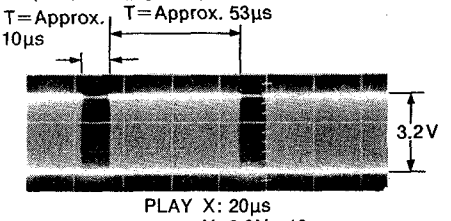
PLAY X: 0.2µs
Y: 0.2V × 10

Ⓓ IC1004 ㊽ Audio serial data output



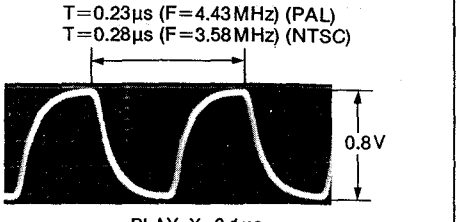
PLAY X: 0.2µs
Y: 0.2V × 10

Ⓔ IC1013 ㉚~㊲, ①~④, ㊶~㊹, ⑧~⑮ (red, blue, green) data input



PLAY X: 20µs
Y: 0.2V × 10

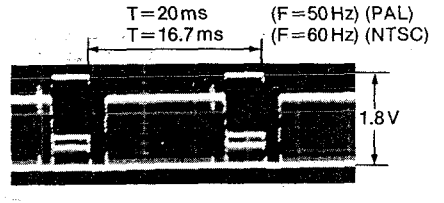
Ⓕ IC1014 ⑥ Subcarrier signal input



PLAY X: 0.1µs
Y: 0.05V × 10

Ⓖ IC1013 ㉓ ㉕ ㉗ Analog color (blue, green, red) output

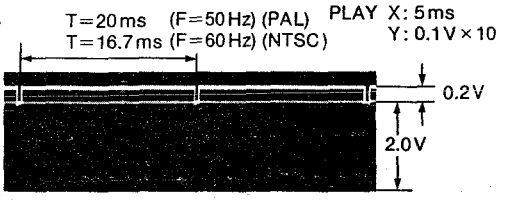
• V signal (color bar screen)



PLAY X: 5ms
Y: 0.1V × 10

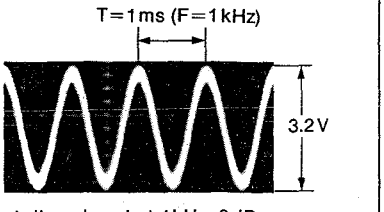
Ⓖ IC1013 ㉓ Analog color (blue) output

• V signal (Blue-back screen)



• The blue-back signal is output at pin ㉓. It is superimposed with a 2V (DC) signal, as shown above. The signals at ㉕ and ㉗ are always 2V.

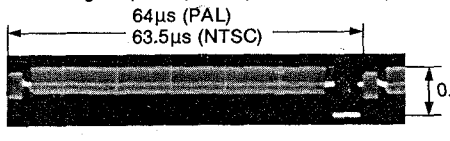
① IC1006 ⑫, ⑮ Audio signal output



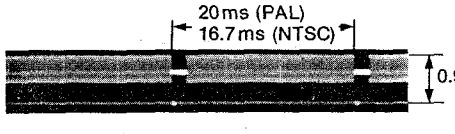
• Test disc played at 1kHz, 0dB (1st track. SZZP1054C)
PLAY X: 1ms
Y: 0.1V × 10

Ⓗ IC1014 ⑳ Video signal output (Blue-Back screen)

• H signal (PLAY, X: 10µs, Y: 0.1V × 10)

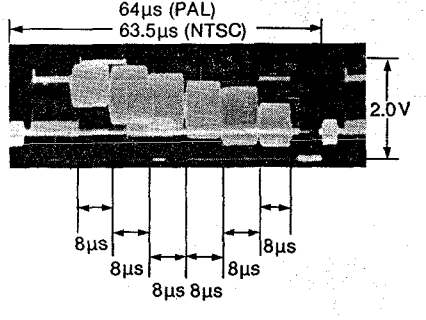


• V signal (PLAY, X: 5ms, Y: 0.1V × 10)

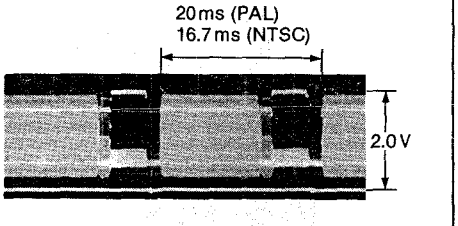


(color bar screen)

• H signal (PLAY, X: 10µs, Y: 0.1V × 10)



• V signal (PLAY, X: 5ms, Y: 0.1V × 10)

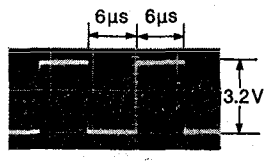
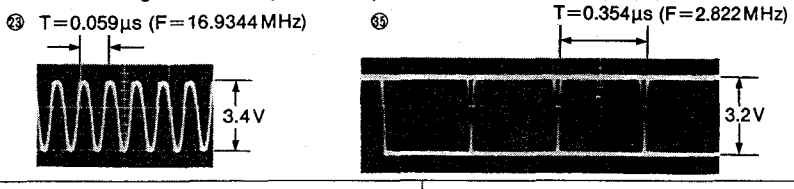
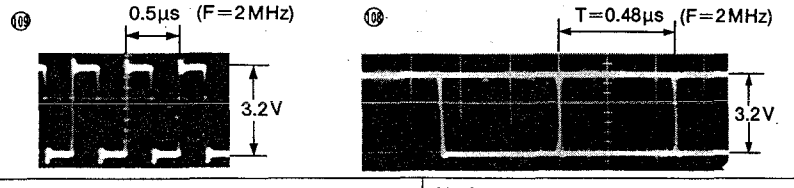
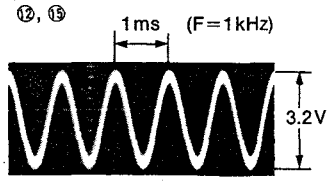


■ DIAGNOSTIC PROCEDURES BY SYMPTOM

Symptom		
CD-DA	**Video-CD**	**Likely location of fault**
TOC NG	TOC NG (both audio and video are NG.) Blue back display	For TOC NG, fault in the CD-DA cirucit. IC701, IC702, IC703, or traverse system
Turntable fails to rotate.	Fails to rotate.	Traverse system, focus servo system (IC701, IC703), supply line, clock line, system microprocessor
Turntable rotates.	Rotates.	Traverse system, tracking servo system/CLV servo system/traverse servo system (IC701, IC702, IC703)
Audio normal	Audio normal, Video NG.	IC1013, IC1014, IC1015
No sound	No sound, Video normal	IC1003, IC1006, IC801
TOC OK, counter OK, but no sound.	TOC OK, counter OK, but no sound and video NG.	CD disc other than DV "Karaoke" soft, video CD and CD-DA

Troubleshooting Procedure 1	CD-DA	No sound

CD-DA: Compact disc digital autio (conventional CD only with audio tracks)

Troubleshooting flowchart	Likely location of fault
Load a CD-DA disc.	
Power ON. Close mode	
Press the SELECT (▶) button to start playback.	
Press the STOP (■) button to stop playback.	
TOC display normal? (Are track No. and time displays normal?) NO	Traverse deck, IC701, IC702 (Refer to "TROUBLE SHOOTING GUIDE" on pages 30, 31.
YES	
Press the SELECT (▶) button to start playback.	
Does sound dropout occur? NO → Normal (go to procedure 2-1.)	
YES	
Check pin ㉜ of IC1010 or pin ㉗ of CN1000.	
(Check) Constant low (0V) Level ——— 0V	
(Check) The following waveform is observed either intermittently or constantly during playback. 	Fault is in the traverse deck or servo board.
Are the following waveforms present at pins ㉓ and ㉟ of IC1010?  NO	IC1010
YES	
Are the following waveforms present at pins ㉘ and ㉙ of IC1004?  NO	IC1004
YES	
Are the following waveforms present at pins ⑫ and ⑮ of IC1006 when the 1kHz, 0dB portion of the 1st track on test disc SZZP1054C is played back?  NO	IC1006
YES	IC801, Q801, Q802

Troubleshooting Procedure 2-1	Video CD	No picture or No sound

Troubleshooting flowchart

Likely location of fault

Load a video CD disc.

Power ON. close mode

Press the SELECT(▶) button.

Connected to TV

Not connected to TV

Dose the menu appear on screen?

NO

YES

Press the STOP (■) button to stop layback.

TOC display normaly? (Are track NO. and time displays normal?)

NO → Traverse deck, IC701, IC702

YES

Press the SELECT (▶) button.

Press the NUMERIC (1 2 ⋮ 0 >0/-/—) button to start playback.

Image noise or unstable picture.

NO → Normal

YES

Is the sound unstable?

NO

YES

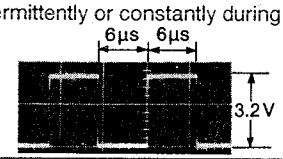
Check the waveforms at pin ㉜ of IC1010 or pin ㉗ of CN1000.

(Check)

Constant low (0V) Level ——— 0V

(Check)

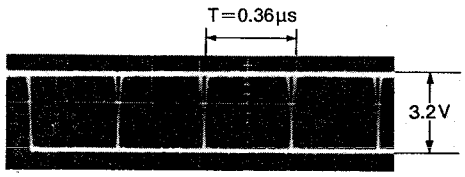
The following waveform is observed either intermittently or constantly during playback.



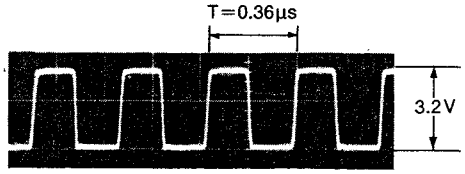
→ Fault is in the traverse deck or servo board.

Are the following waveforms present at pins ㉟, ㊳ of IC1010.

㉟ CDDATA



㊳ CDSCK



NO → IC1010

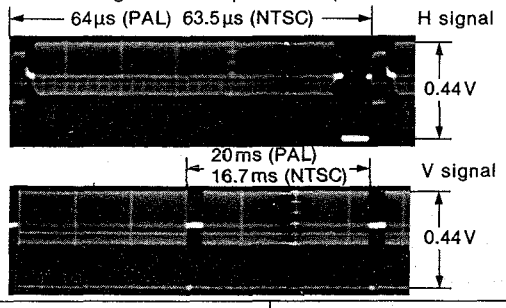
YES

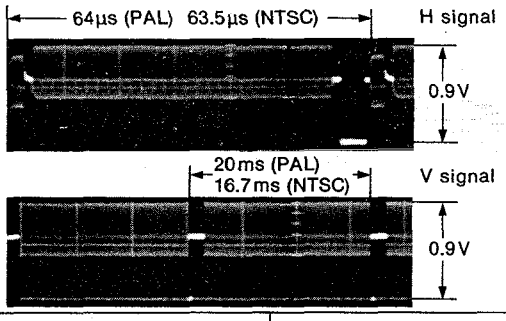
Video line → Procedure 2-3

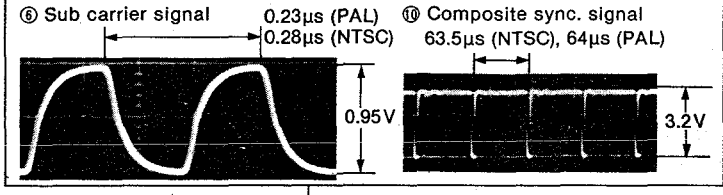
Audio line → Procedure 2-4

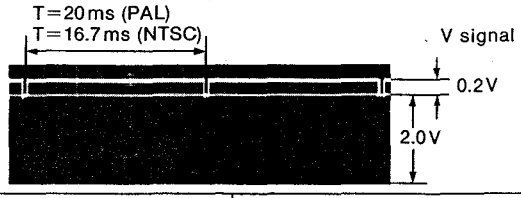
Troubleshooting Procedure 2-2	Video CD blue back	No blue back

Troubleshooting flowchart	Likely location of fault
Load a video CD disc.	
Press the SELECT (▶) button.	
Press the STOP (■) button to stop playback.	
Does blue-back screen appear? — YES → Normal	
NO	
Is the following waveform present at pin ② of CN1000? — YES →	Fault is in the main board (video output block).
NO	
Is the following waveform present at pin ⑳ of IC1014? — YES →	IC1015
NO	
Are the following waveforms present at pins ⑥ and ⑩ of IC1014? — NO →	IC1010, IC1004
YES	
Is the following waveform present at pin ㉓ of IC1013? — NO →	IC1013, IC1004
	IC1014









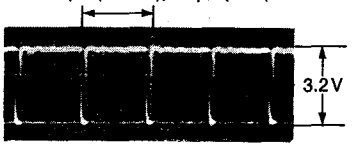
Troubleshooting Procedure 2-3	Video portion of video CD	No picture

Troubleshooting flowchart	Likely location of fault

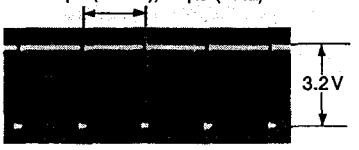
● Video signal line

Are the following waveforms present at pins ⑮ and ⑯ of IC1004?

⑮ Composite sync. signal
63.5µs (NTSC), 64µs (PAL)



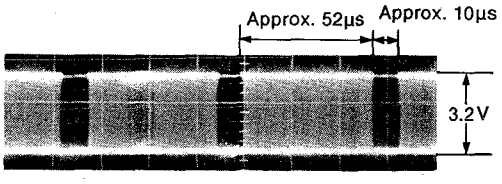
⑯ Horizontal sync. signal
63.5µs (NTSC), 64µs (PAL)



NO → IC1004

YES

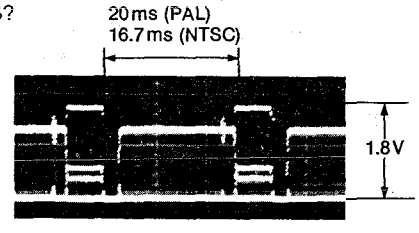
Are the following waveforms present at pins ㉚~㊲, ①~④, ㊶~㊹ and ⑧~⑮ of IC1013?



NO → IC1004

YES

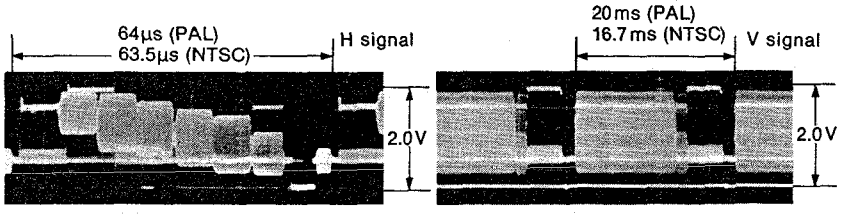
Are the following waveforms present at pins ㉓, ㉙, ㉗ of IC1013?



NO → IC1013

YES

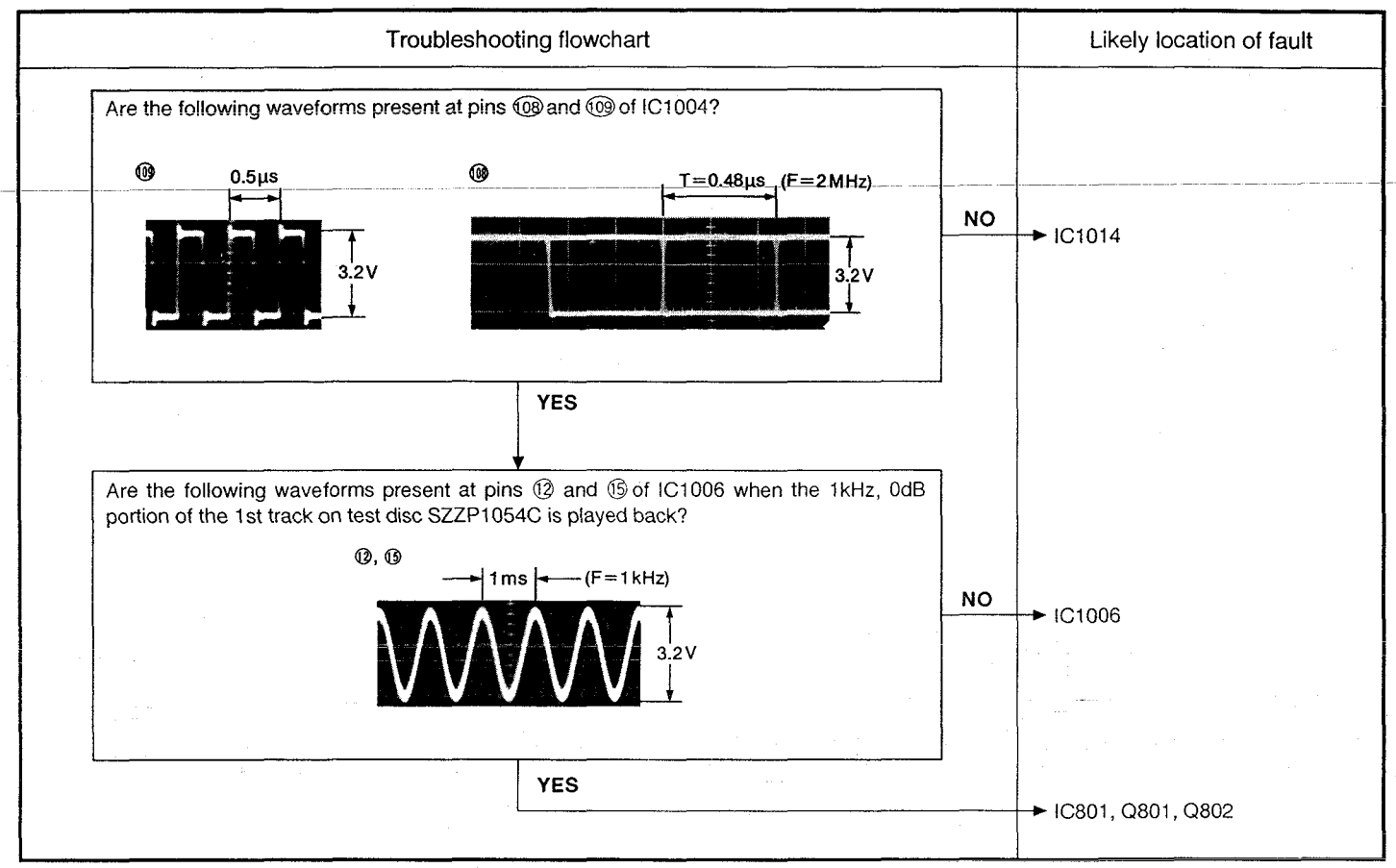
Is the following waveform present at pin ⑳ of IC1014 when color bar is on the screen?



NO → IC1014

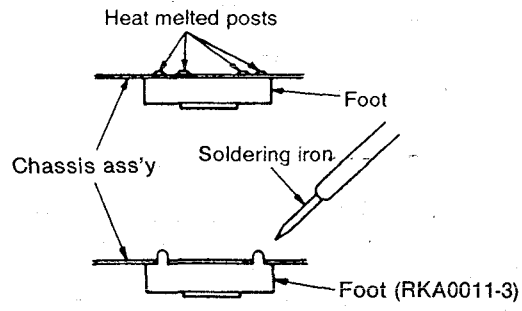
YES → IC1015 or beyond

Troubleshooting Procedure 2-4	Audio portion of video CD	No sound

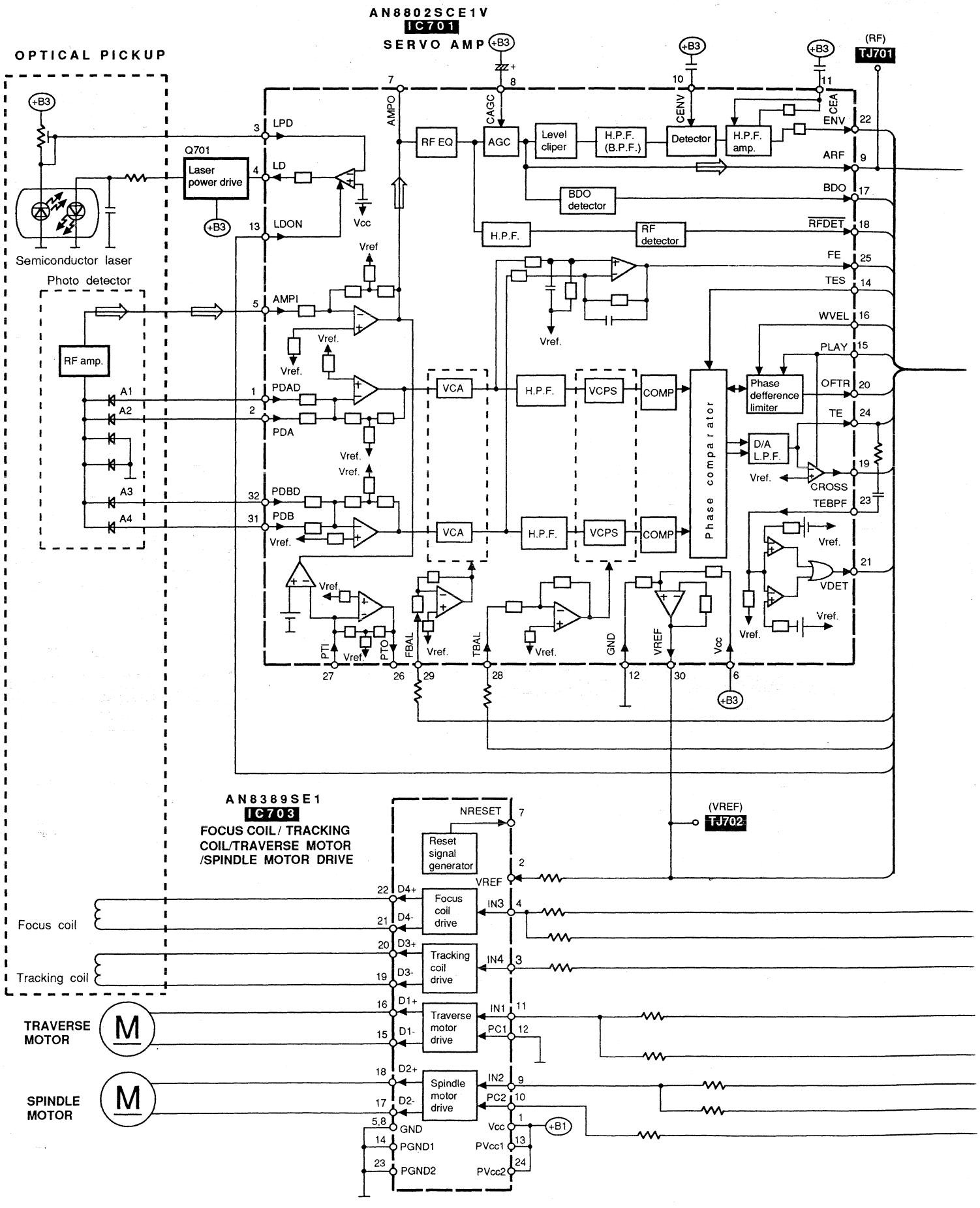


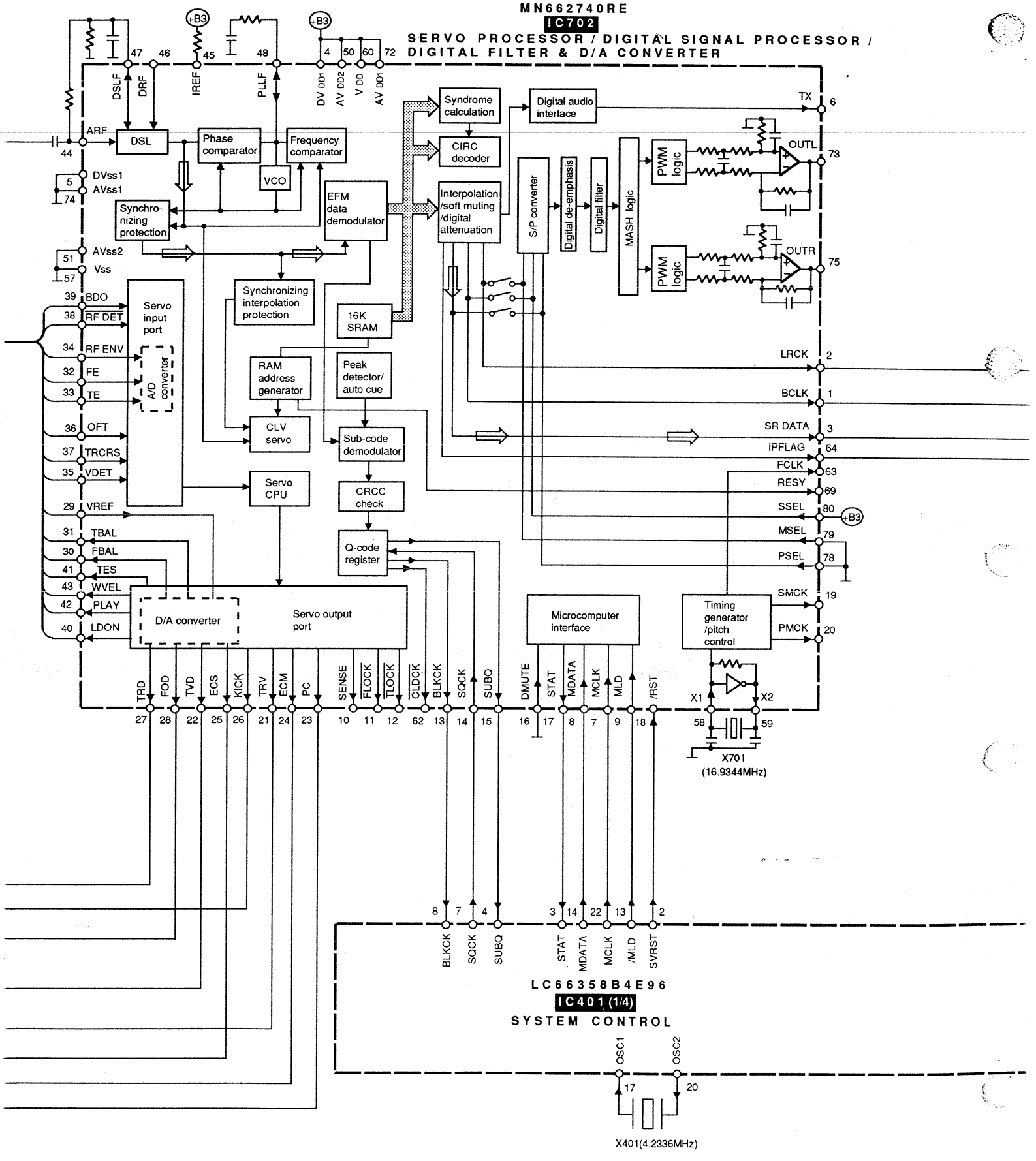
■ REPLACEMENT OF THE FOOT

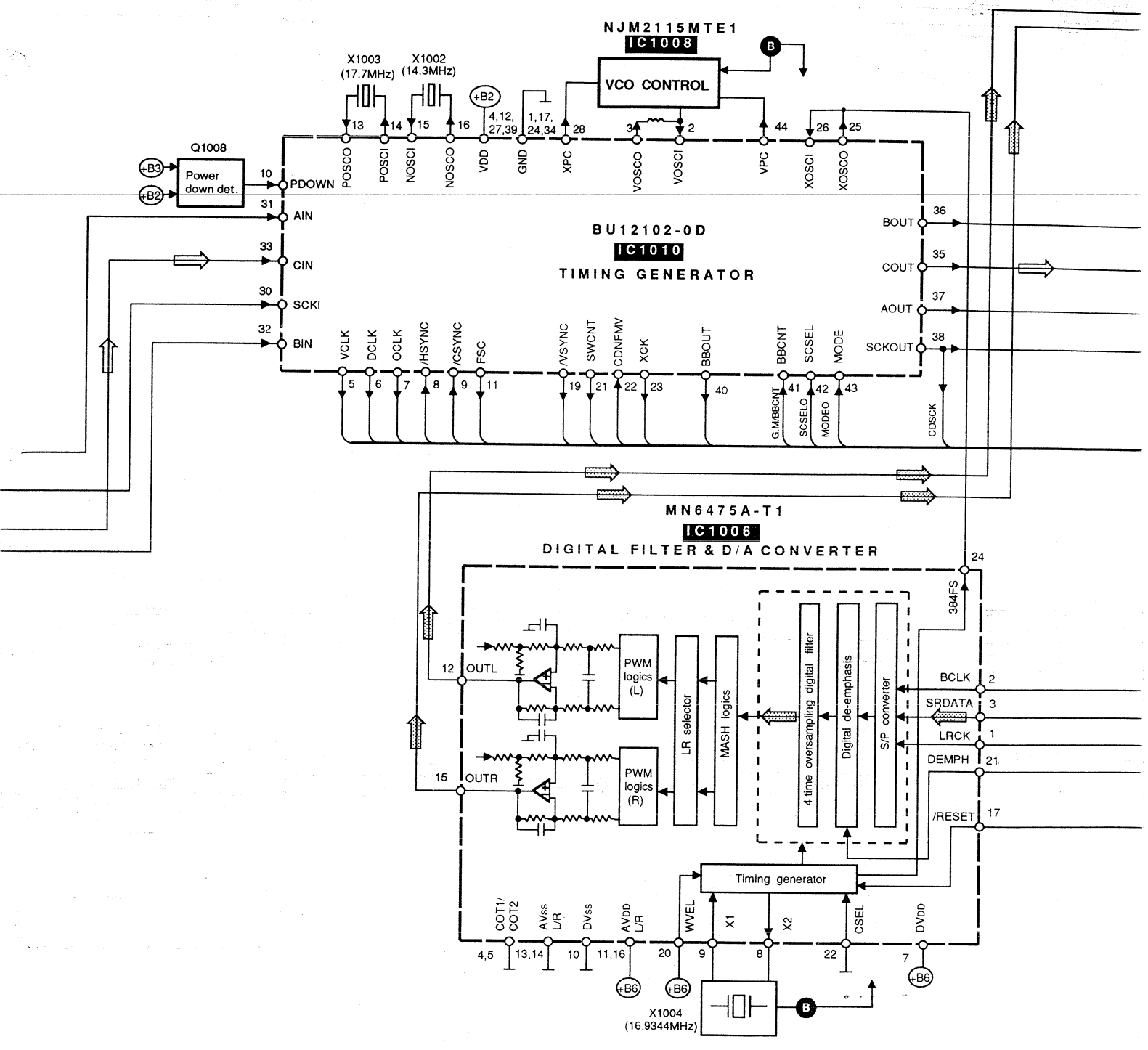
1. Remove the 4 heat melted posts on the Chassis ass'y with a pair of nippers or similar tool.
2. To replace the foot (RKA0011-3) on the Chassis ass'y melt the 4 posts with a soldering iron.



■ BLOCK DIAGRAM



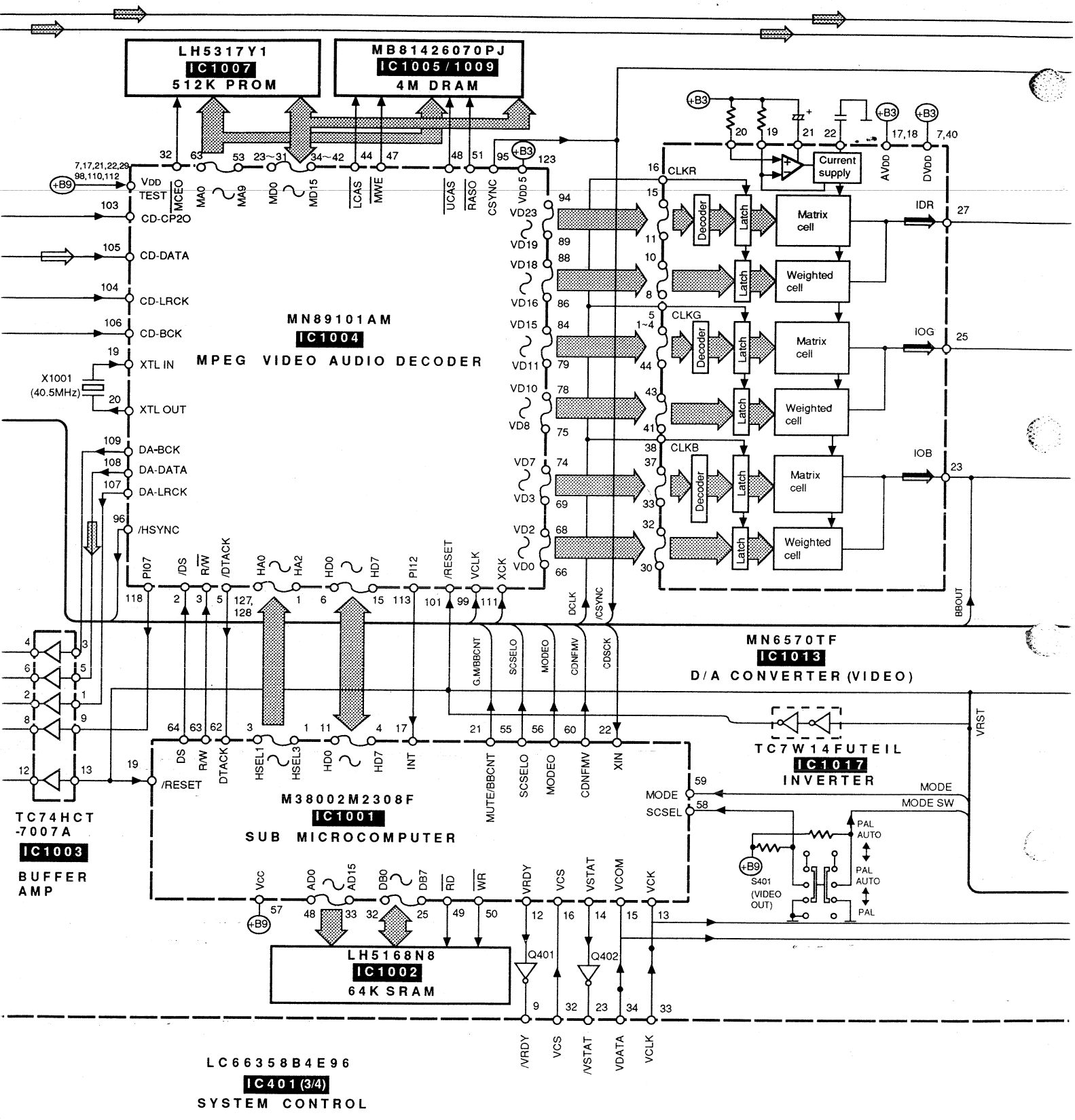

MN662740RE
IC702
SERVO PROCESSOR / DIGITAL SIGNAL PROCESSOR / DIGITAL FILTER & D/A CONVERTER
+B3
47
46
45
48
4
50
60
72
DSLF
DRF
IREF
PLLF
DV DD1
AV DD2
V DD
AV DD1
ARF
44
DSL
Phase comparator
Frequency comparator
VCO
DVss1
5
AVss1
74
Synchro-nizing protection
EFM data demodulator
Syndrome calculation
CIRC decoder
Interpolation /soft muting /digital attenuation
Digital audio interface
S/P converter
Digital de-emphasis
Digital filter
MASH logic
PWM logic
PWM logic
TX
6
OUTL
73
OUTR
75
AVss2
51
Vss
57
Synchronizing interpolation protection
16K SRAM
39
BDO
38
RF DET
34
RF ENV
32
FE
33
TE
36
OFT
37
TRCRS
35
VDET
Servo input port
A/D converter
RAM address generator
Peak detector/ auto cue
CLV servo
Sub-code demodulator
Servo CPU
CRCC check
29
VREF
31
TBAL
30
FBAL
41
TES
43
WVEL
42
PLAY
40
LDON
Q-code register
D/A converter
Servo output port
Microcomputer interface
Timing generator /pitch control
LRCK
2
BCLK
1
SR DATA
3
IPFLAG
64
FCLK
63
RESY
69
SSEL
80
+B3
MSEL
79
PSEL
78
SMCK
19
PMCK
20
TRD
27
FOD
28
TVD
22
ECS
25
KICK
26
TRV
21
ECM
24
PC
23
SENSE
10
FLOCK
11
TLOCK
12
CLDCK
62
BLKCK
13
SQCK
14
SUBQ
15
DMUTE
16
STAT
17
MDATA
8
MCLK
7
MLD
9
/RST
18
X1
X2
58
59
X701
(16.9344MHz)
8
7
4
3
14
22
13
2
BLKCK
SQCK
SUBQ
STAT
MDATA
MCLK
/MLD
SVRST
LC66358B4E96
IC401 (1/4)
SYSTEM CONTROL
OSC1
OSC2
17
20
X401(4.2336MHz)

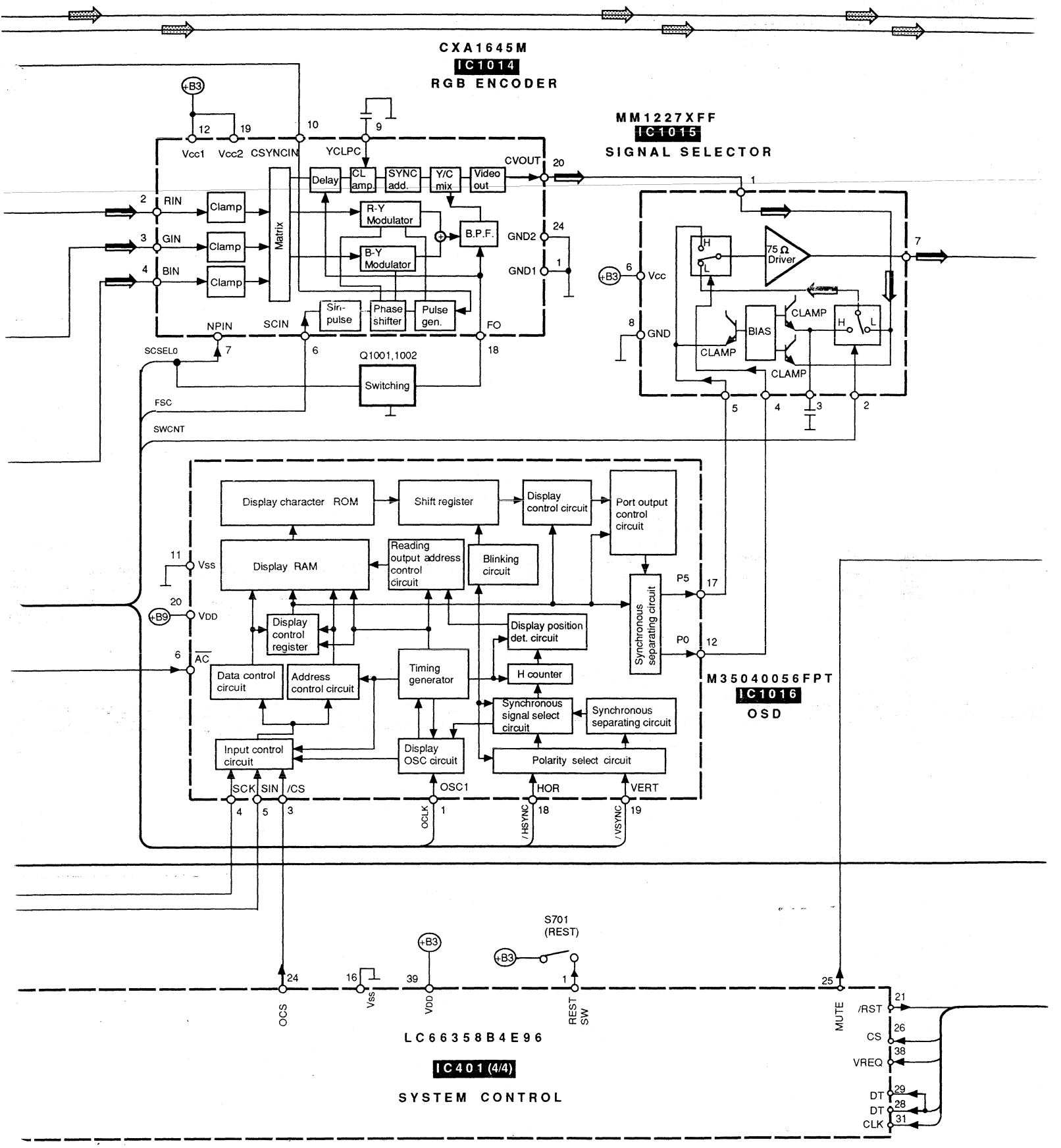


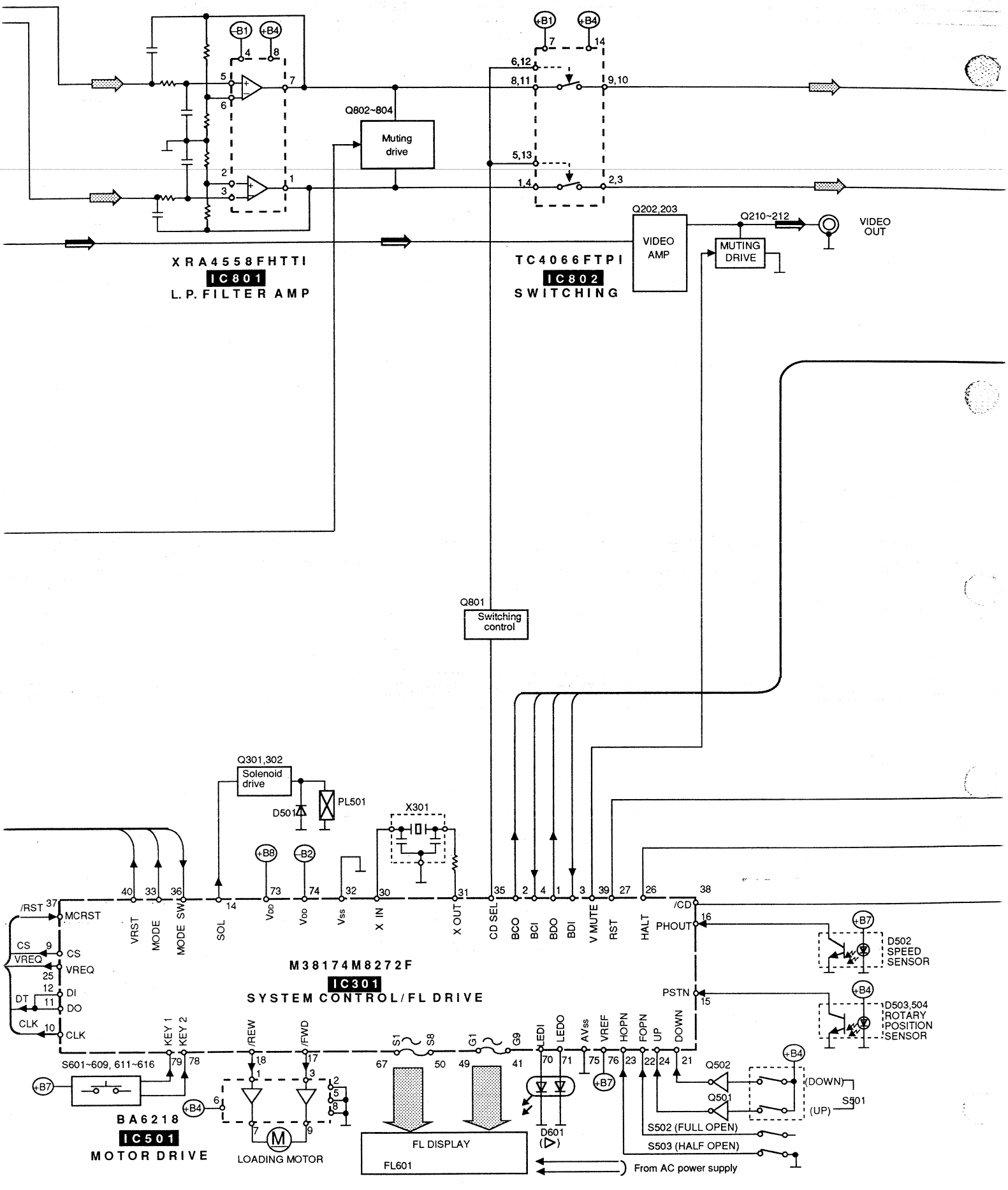
LC66358B4E96

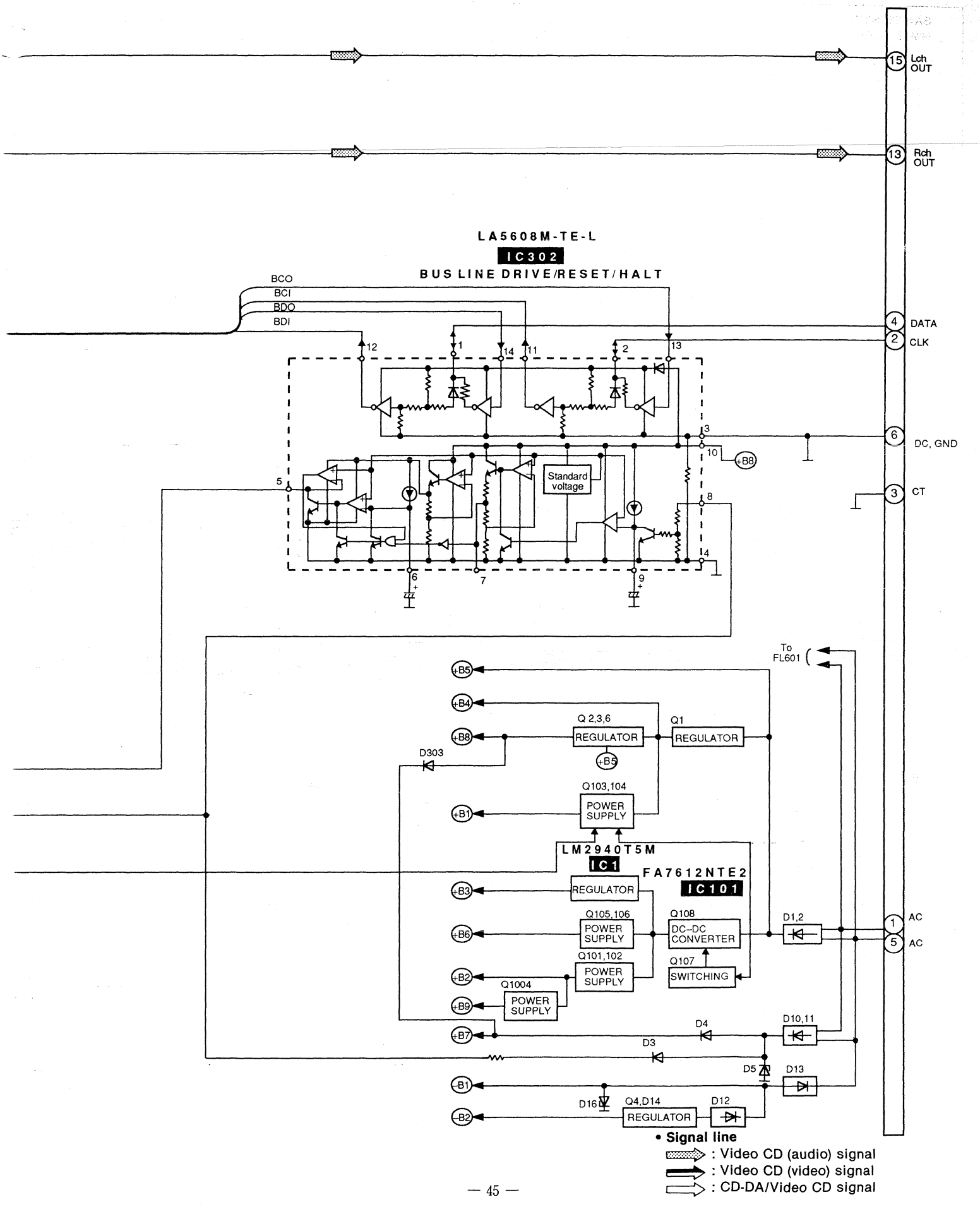
IC401 (2/4)

SYSTEM CONTROL


LH5317Y1
IC1007
512K PROM
MB81426070PJ
IC1005/1009
4M DRAM
MN89101AM
IC1004
MPEG VIDEO AUDIO DECODER
X1001
(40.5MHz)
MN6570TF
IC1013
D/A CONVERTER (VIDEO)
Matrix cell
Weighted cell
Decoder
Latch
Current supply
IDR
IOG
IOB
CLKR
CLKG
CLKB
TC74HCT
-7007A
IC1003
BUFFER
AMP
M38002M2308F
IC1001
SUB MICROCOMPUTER
TC7W14FUTEIL
IC1017
INVERTER
MODE
MODE SW
PAL
AUTO
S401
(VIDEO
OUT)
LH5168N8
IC1002
64K SRAM
Q401
Q402
LC66358B4E96
IC401(3/4)
SYSTEM CONTROL

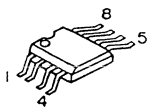

CXA1645M
IC1014
RGB ENCODER
MM1227XFF
IC1015
SIGNAL SELECTOR
+B3
12
19
10
9
Vcc1
Vcc2
CSYNCIN
YCLPC
CVOUT
20
Delay
CL amp.
SYNC add.
Y/C mix
Video out
2
RIN
3
GIN
4
BIN
Clamp
Matrix
R-Y Modulator
B-Y Modulator
B.P.F.
GND2
24
GND1
1
Sir-pulse
Phase shifter
Pulse gen.
NPIN
SCIN
FO
SCSEL0
7
6
18
Q1001,1002
Switching
FSC
SWCNT
1
7
6
Vcc
8
GND
H
L
75Ω Driver
BIAS
CLAMP
5
4
3
2
Display character ROM
Shift register
Display control circuit
Port output control circuit
Display RAM
Reading output address control circuit
Blinking circuit
11
Vss
20
+B9
VDD
Display control register
Display position det. circuit
6
AC
Data control circuit
Address control circuit
Timing generator
H counter
Synchronous signal select circuit
Synchronous separating circuit
Input control circuit
Display OSC circuit
Polarity select circuit
P5
17
P0
12
Synchronous separating circuit
M350400056FPT
IC1016
OSD
SCK
SIN
/CS
OSC1
HOR
VERT
4
5
3
OCLK
1
/HSYNC
18
/VSYNC
19
S701
(REST)
+B3
24
16
39
1
25
OCS
Vss
VDD
REST SW
MUTE
/RST
21
CS
26
VREQ
38
DT
29
DT
28
CLK
31
LC66358B4E96
IC401 (4/4)
SYSTEM CONTROL

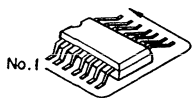

XRA4558FHTTI
IC801
L.P. FILTER AMP
Q802~804
Muting drive
TC4066FTPI
IC802
SWITCHING
Q202,203
VIDEO AMP
Q210~212
MUTING DRIVE
VIDEO OUT
Q801
Switching control
Q301,302
Solenoid drive
PL501
D501
X301
M38174M8272F
IC301
SYSTEM CONTROL/FL DRIVE
/RST
MCRST
CS
VREQ
DI
DO
CLK
VRST
MODE
MODE SW
SOL
VDD
VDD
VSS
X IN
X OUT
CD SEL
BCO
BCI
BDO
BDI
V MUTE
RST
HALT
/CD
PHOUT
PSTN
D502 SPEED SENSOR
D503,504 ROTARY POSITION SENSOR
KEY 1
KEY 2
/REW
/FWD
S1
S8
G1
G9
LEDI
LEDO
AVss
VREF
HOPN
FOPN
UP
DOWN
S601~609, 611~616
Q502
Q501
(DOWN)
(UP)
S501
S502 (FULL OPEN)
S503 (HALF OPEN)
BA6218
IC501
MOTOR DRIVE
LOADING MOTOR
FL DISPLAY
FL601
D601
From AC power supply


15 Lch OUT
13 Rch OUT
LA5608M-TE-L
IC302
BUS LINE DRIVE/RESET/HALT
BCO
BCI
BDO
BDI
4 DATA
2 CLK
6 DC, GND
3 CT
Standard voltage
+B8
To FL601
+B5
+B4
+B8
Q 2,3,6 REGULATOR
Q1 REGULATOR
+B5
D303
Q103,104 POWER SUPPLY
+B1
LM2940T5M
IC1
FA7612NTE2
IC101
+B3 REGULATOR
Q105,106 POWER SUPPLY
Q108 DC-DC CONVERTER
D1,2
1 AC
5 AC
Q101,102 POWER SUPPLY
Q107 SWITCHING
+B2
Q1004 POWER SUPPLY
+B9
+B7
D4
D10,11
D3
D5
D13
-B1
D16
Q4,D14 REGULATOR
D12
-B2
• Signal line
: Video CD (audio) signal
: Video CD (video) signal
: CD-DA/Video CD signal

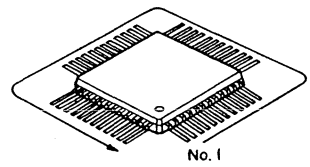
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

BA4558FHTT1
MM1227XFF

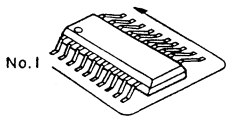




TC4066BFTP1	14 Pin
TC74HCT7007A	14 Pin
TC74HC4050EL	16 Pin

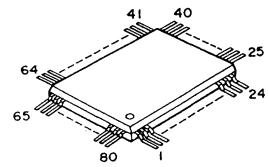


BU12102-0D	44 Pin
MN6570TF	44 Pin
M38002M2308F	64 Pin
MN662740RE	80 Pin
MN89101AM	128 Pin

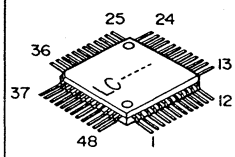


FA7612NTE2	8 Pin	MN6475A-T1	24 Pin
NJM2115MTE1	8 Pin	LH5168N8	28 Pin
LA5608M-TE-L	14 Pin	LH5317Y1	28 Pin
M35040056FPT	20 Pin	AN8802SCE1V	32 Pin
CXA1645M	24 Pin		

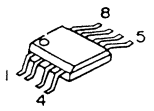
M38174M8272F



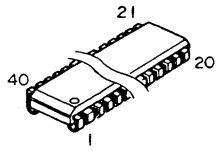
LC66358B4E96



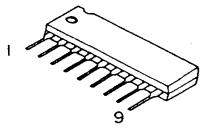
TC7W14FUTE1L



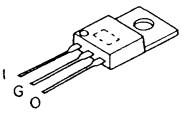
MB81426070PJ



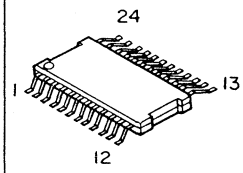
BA6218

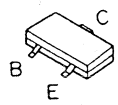


LM2940T5M



AN8389SE1

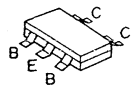




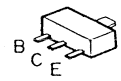
2SB970RSTX
2SC2404CTX
2SD1328STTX
2SD1328RSTTX
UN5111TX

UN5112TX
UN5115TX
UN5211TX
2SD1819QRSTX

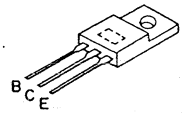
FMW1T98
FMW2T148

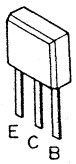


2SA1896STTD
2SB766QRSTX



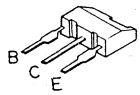
2SB1548PQAU



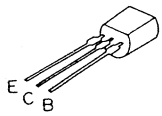


2SA1309AQSTA
2SC3311AIQST
UN421FTA
UN4219TA

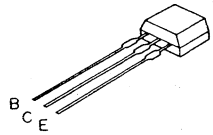
2SB1238QRTV6



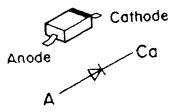
2SB621ARSTA



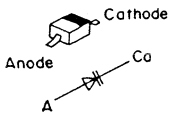
DTC143ESTP



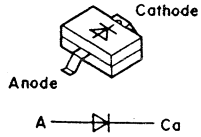
MA110TX



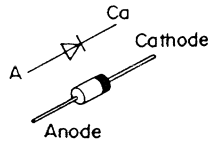
MA304TX



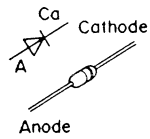
MA701TX

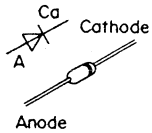


RL1N4003N02

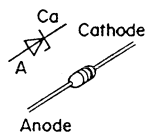


MA185TA
1SS291TA

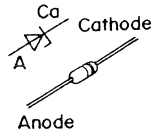




MA165TA
MA167TA
MA723TA
MA700ATA

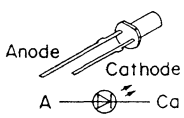


MA4051MTA
MA4056HTA
MA4062MTA
MA4068MTA
MA4075MTA

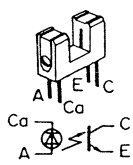


MA4100MTA
MA4300MTA

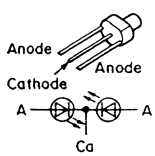
GL380TB
PT381TB



RSQGP1S53V



SPR-305MDTF



■ SCHEMATIC DIAGRAM (Parts list on pages 80~82, 87~89.)

(This schematic diagram may be modified at any time with development of new technology.)

Note:

- **S401** : Video out switch.
- **S501** : Traverse deck position detect switch.
- **S502** : Disc tray full open detect switch.
- **S503** : Disc tray half open detect switch.
- **S601** : Open/close (OPEN/CLOSE, ▲) switch.
- **S602** : Play (▷ SELECT) switch.
- **S603** : F. Skip/search (NEXT ▶▶, ▶▶I) switch.
- **S604** : Pause (▯▯) switch.
- **S605** : R. Skip/search (PREV I◀◀/◀◀) switch.
- **S606** : Stop/menu on, off (□ MENU) switch.
- **S607~609** : Disc (DISC 1~3) switches. [S607: 3, S608: 2, S609: 1]
- **S611** : Repeat (REPEAT/NUMERIC +) switch.
- **S612** : Random play (RANDOM/NUMERIC −) switch.
- **S613** : Return (RETURN, ↶) switch.
- **S614** : Resume play (RESUME) switch.
- **S615** : Auto pause (AUTO PAUSE) switch.
- **S616** : Ai edit (AI EDIT. ALBUM) switch.
- **S701** : Rest detector.

Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

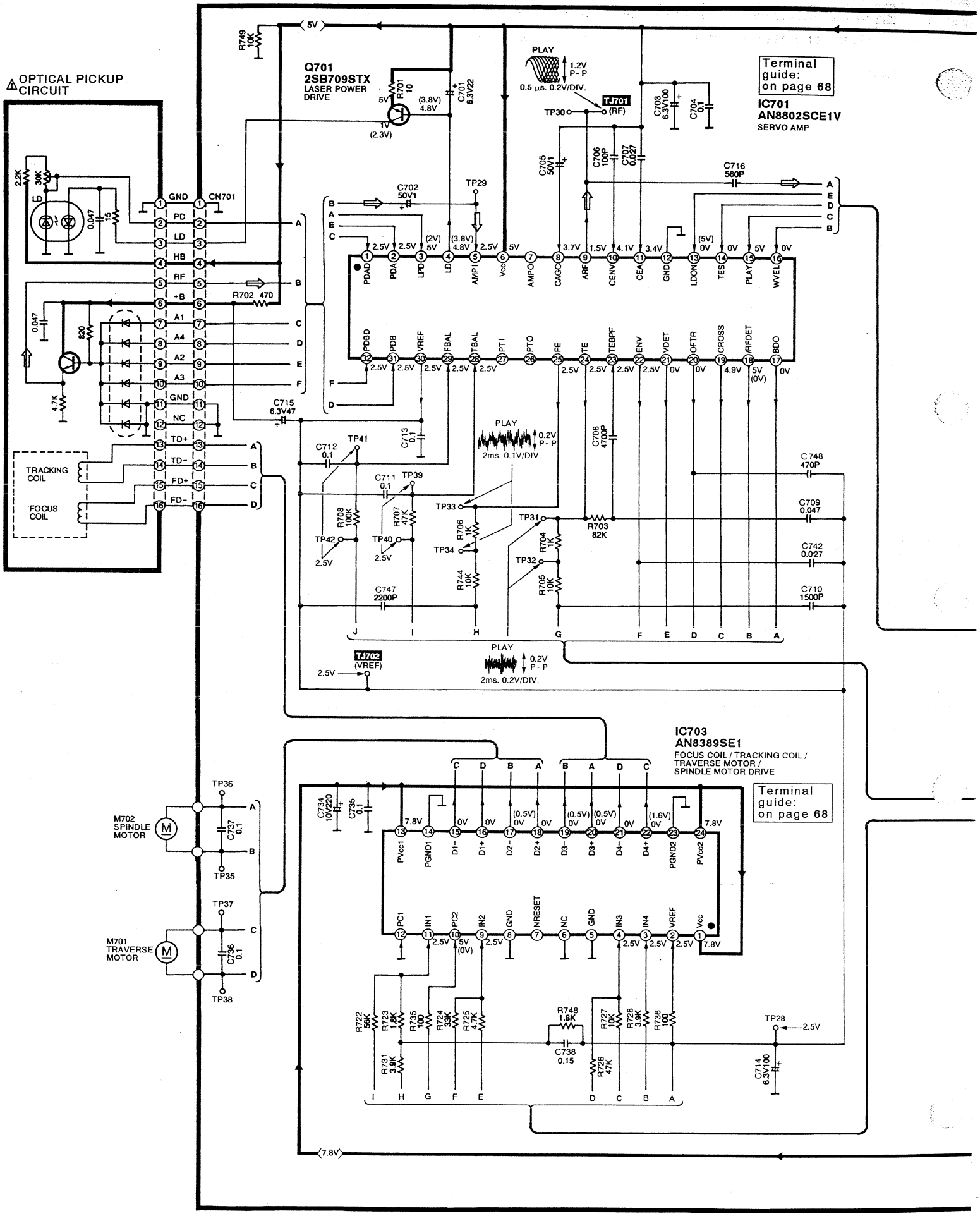
*The parenthesized are the values of voltage generated during playing (Video CD Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.

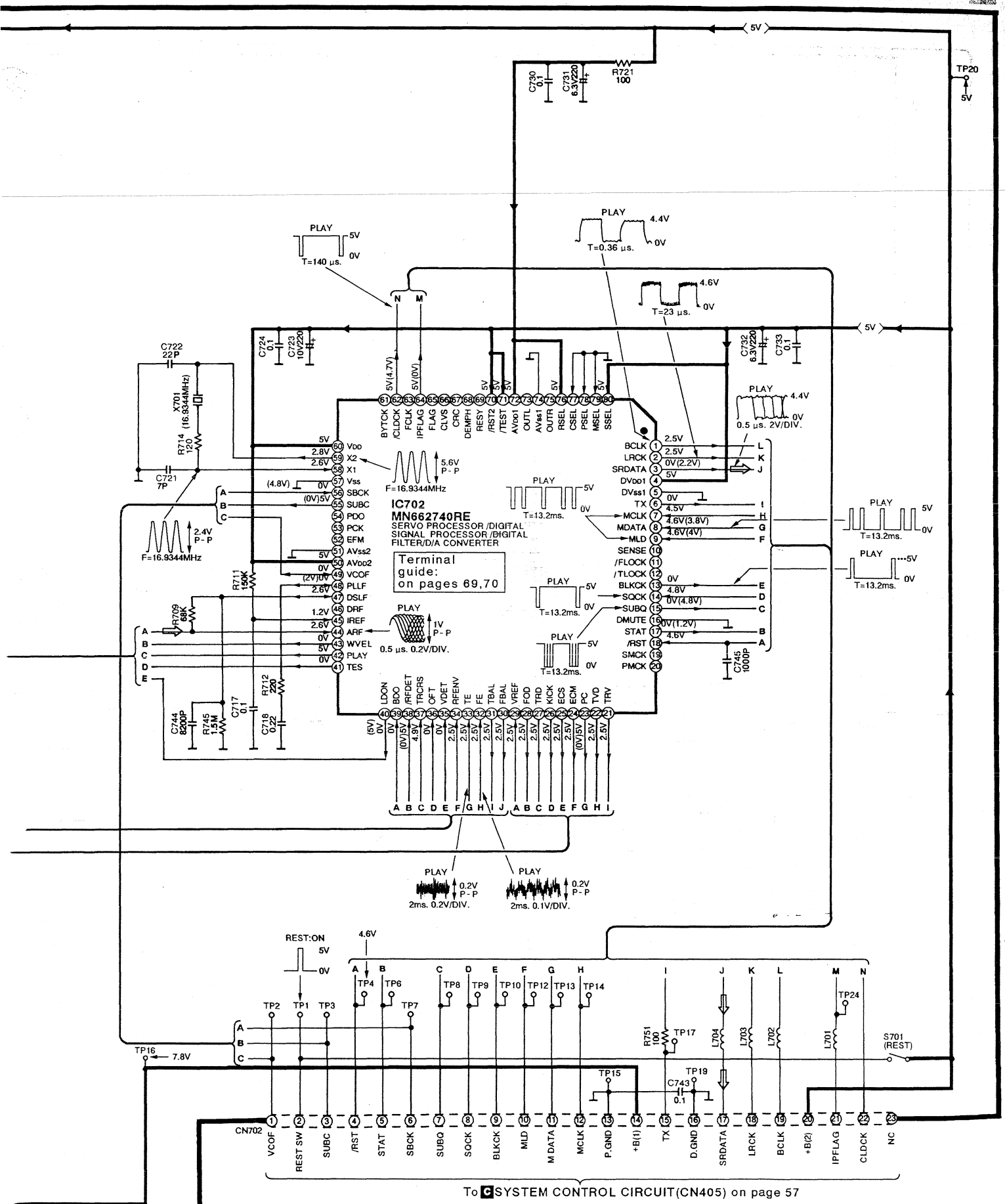
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used as occation calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The supply part number is described alone in the replacement parts.

Part No.	Production Part No.	Supply Part No.
IC11	LM2940T5M	LM2940T5
IC1008	NJM2115MTE1	NJM2115MT1

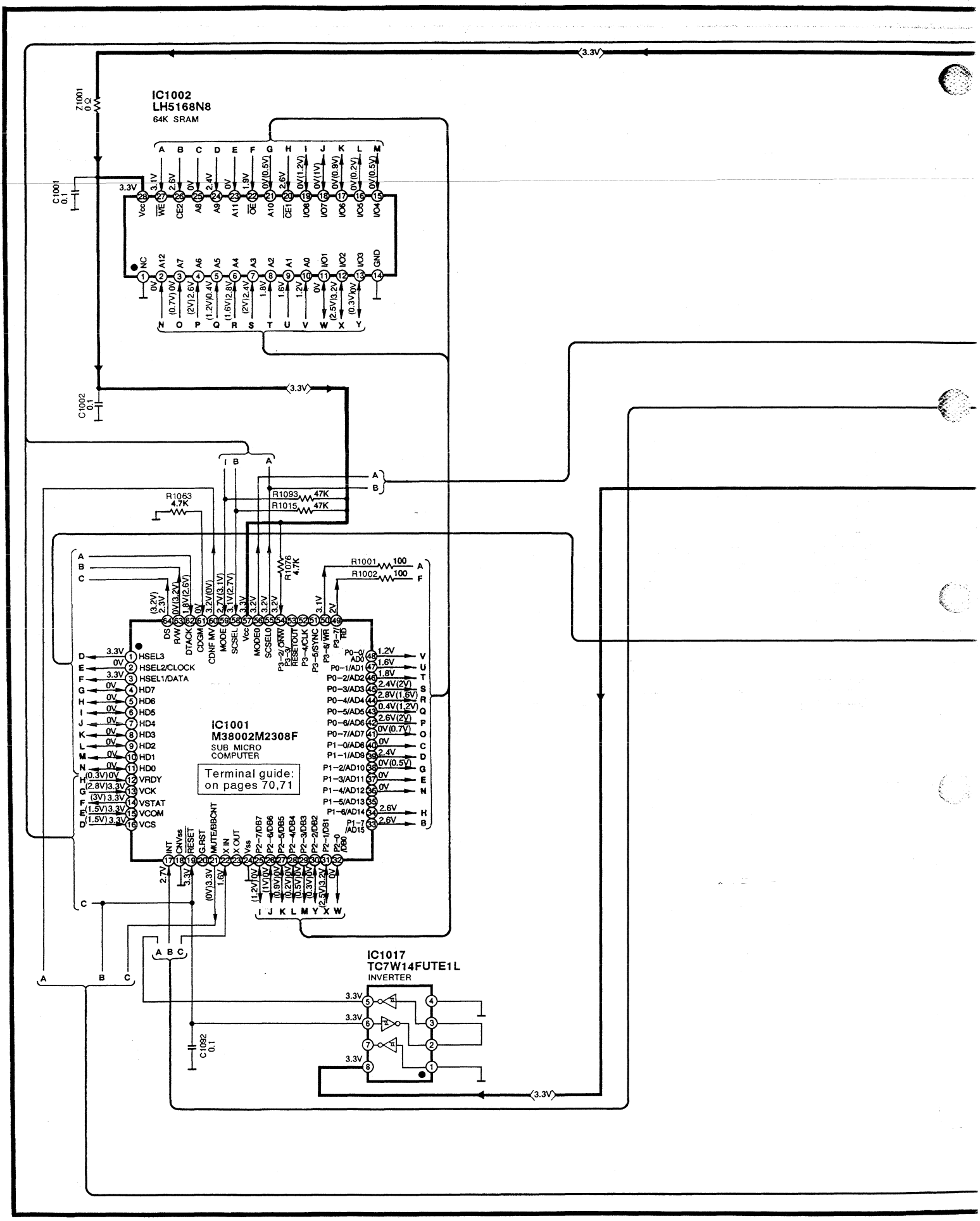
- Signal line
  - ▬▬ / ▬ ▬ ▬ : Positive voltage lines and negative voltage lines.
  - ⇨ : Video CD (audio) signal
  - ⇨ : Video CD (video) signal
  - ⇨ : CD-DA/Video CD signal

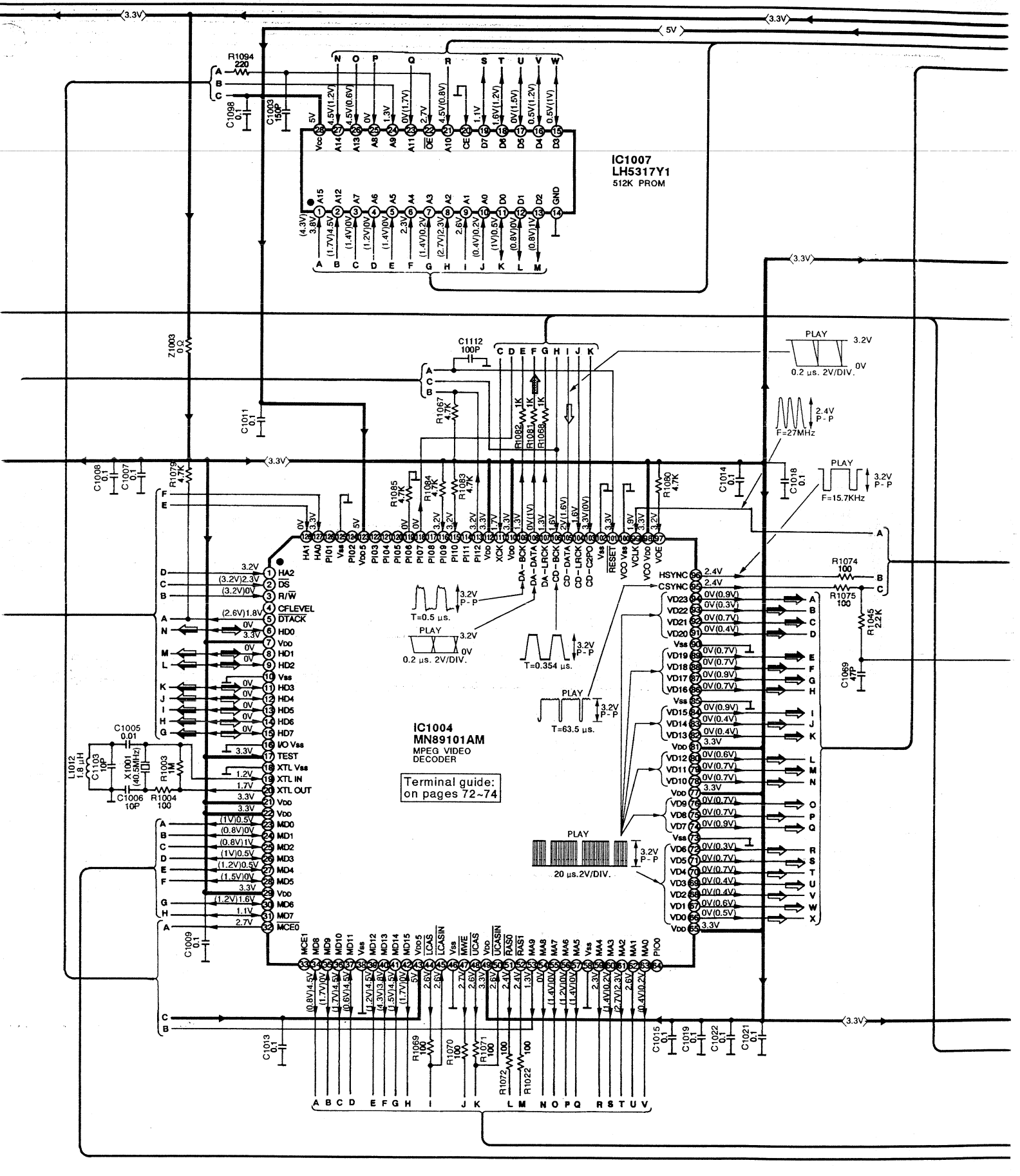
A SERVO CIRCUIT (P.C.Board:on page 62)



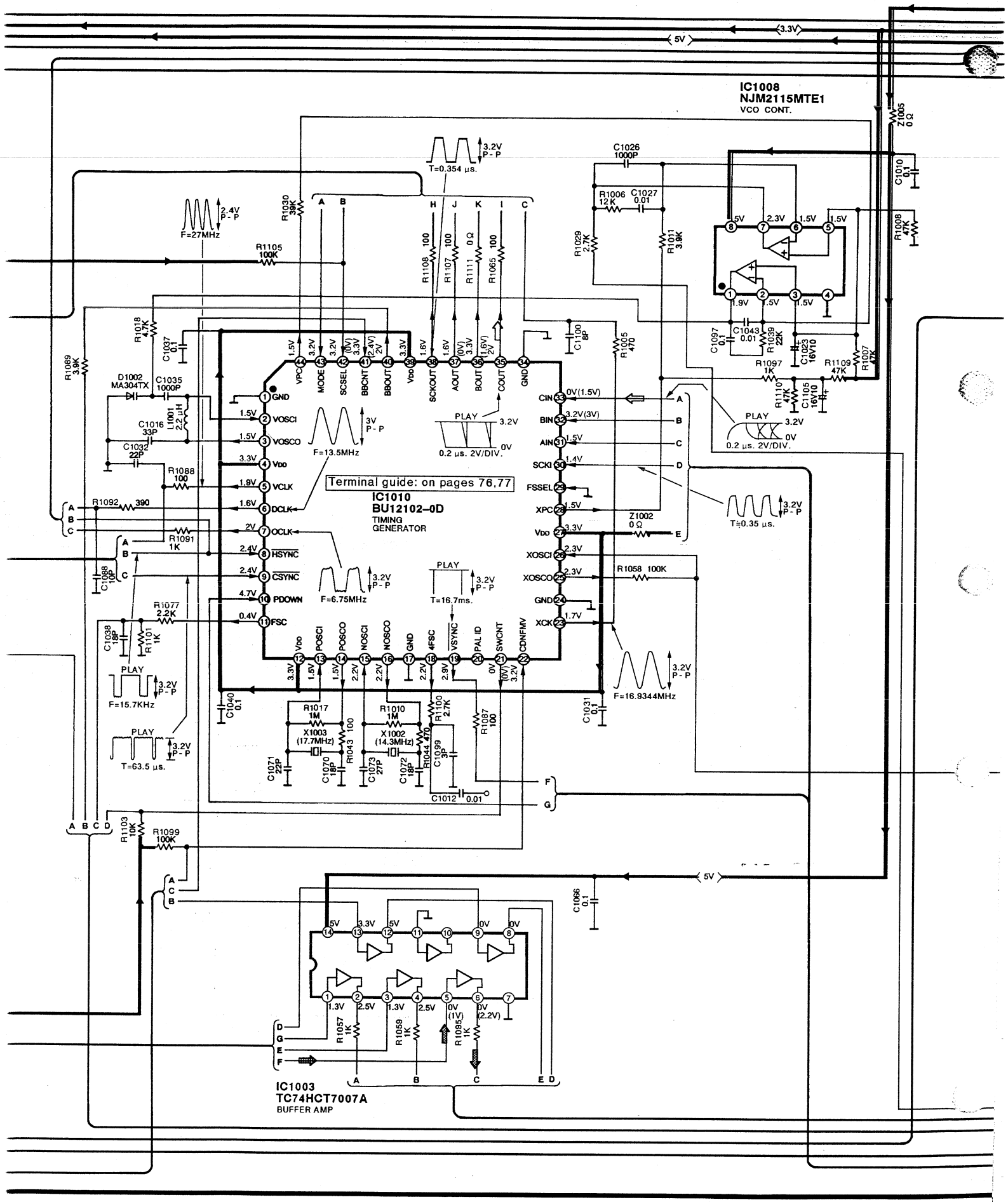

IC702
MN662740RE
SERVO PROCESSOR /DIGITAL SIGNAL PROCESSOR /DIGITAL FILTER/D/A CONVERTER
Terminal guide: on pages 69,70
F=16.9344MHz
T=140 µs.
T=0.36 µs.
T=23 µs.
T=13.2ms.
0.5 µs. 2V/DIV.
0.5 µs. 0.2V/DIV.
2ms. 0.2V/DIV.
2ms. 0.1V/DIV.
REST:ON
CN702
VCOF
REST SW
SUBC
/RST
STAT
SBCK
SUBQ
SQCK
BLKCK
MLD
M DATA
MCLK
P.GND
+B(1)
TX
D.GND
SRDATA
LRCK
BCLK
+B(2)
IPFLAG
CLDCK
NC
S701 (REST)
To C SYSTEM CONTROL CIRCUIT(CN405) on page 57

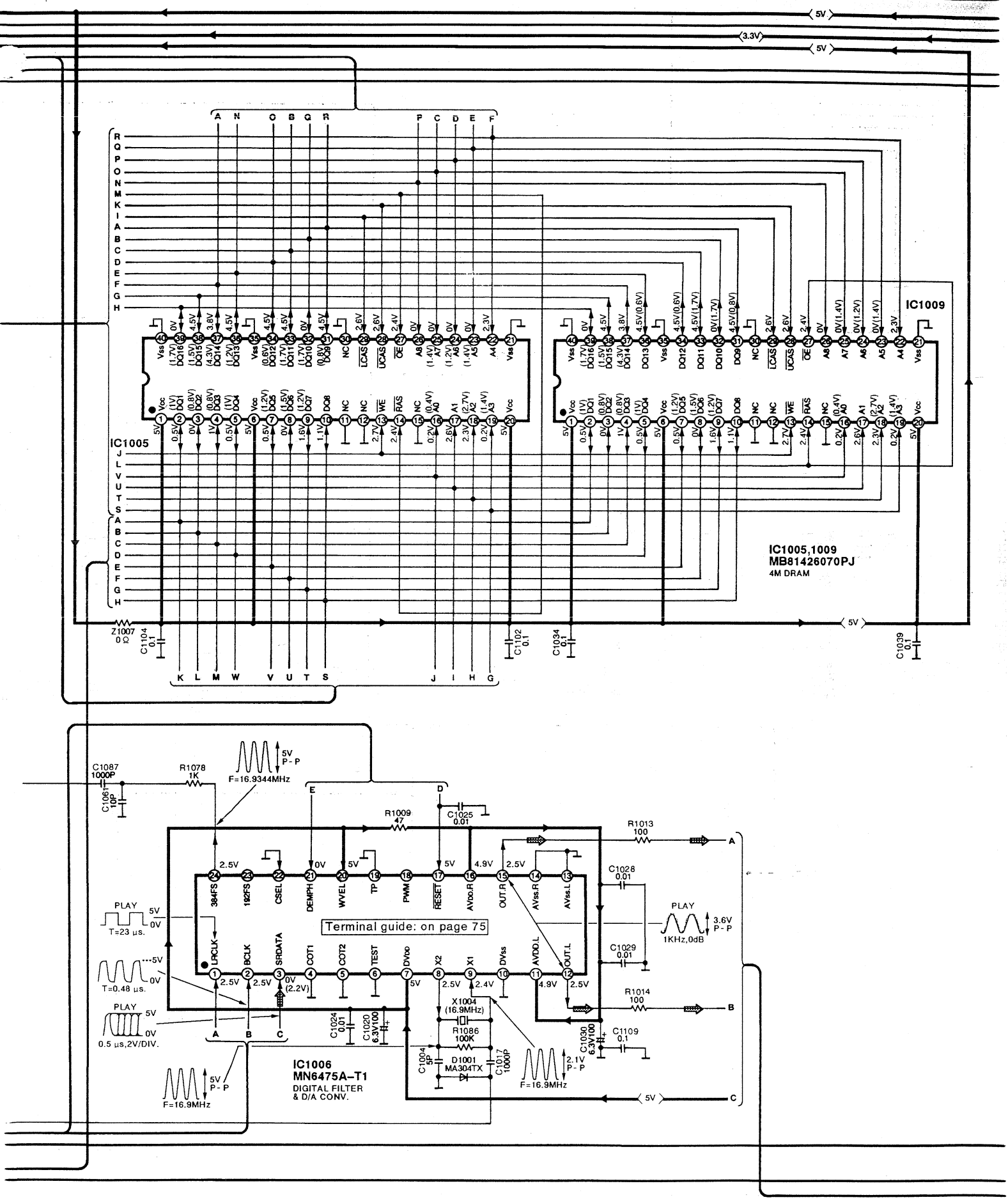
B VIDEO CIRCUIT (P.C.Board:on page 63)



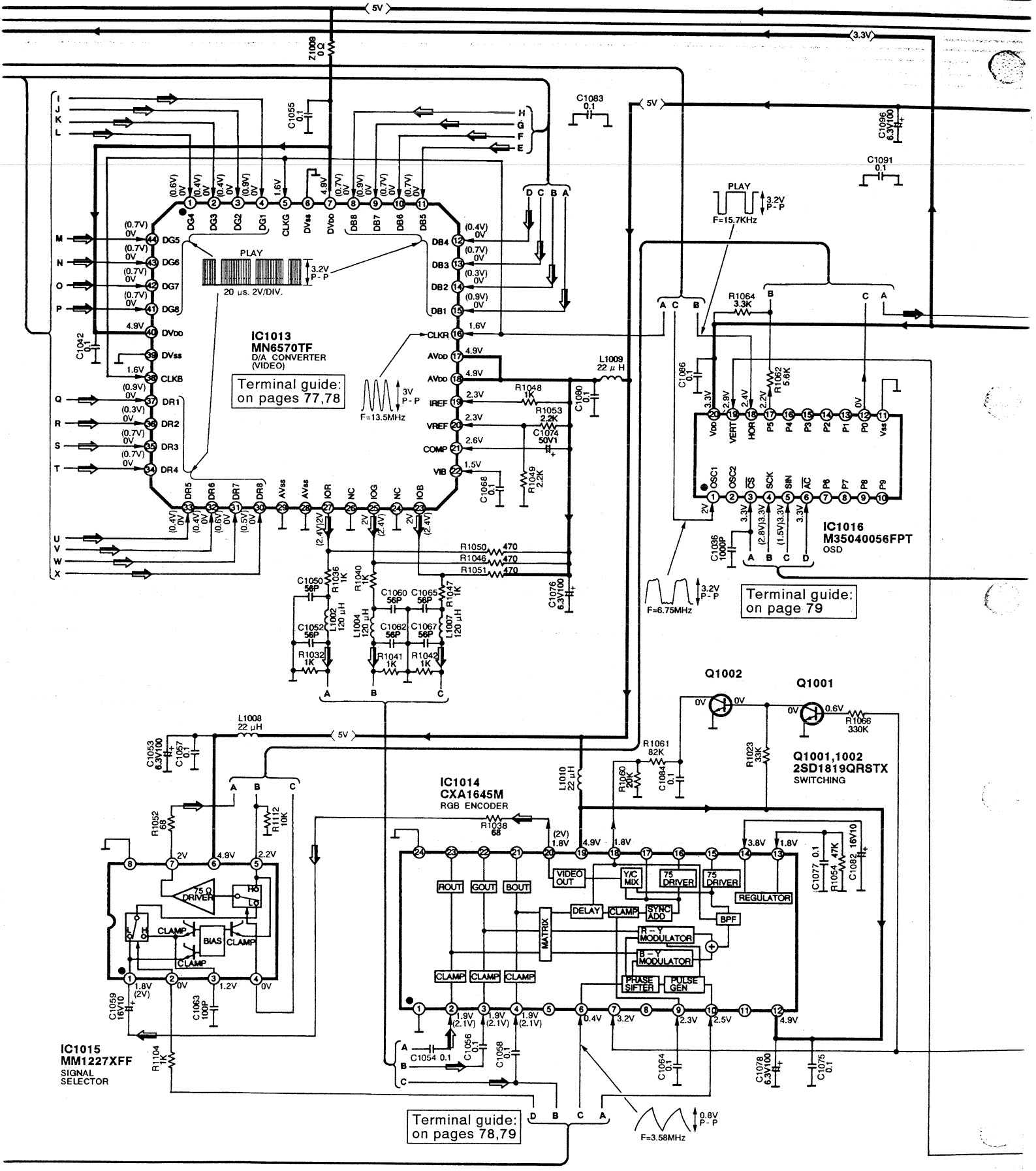

IC1007
LH5317Y1
512K PROM
IC1004
MN89101AM
MPEG VIDEO
DECODER
Terminal guide:
on pages 72~74
3.3V
5V
PLAY
0.2 µs. 2V/DIV.
F=27MHz
F=15.7KHz
T=0.5 µs.
T=0.354 µs.
T=63.5 µs.
20 µs.2V/DIV.
HSYNC
CSYNC
HA2
DS
R/W
CFLEVEL
DTACK
HD0
HD1
HD2
HD3
HD4
HD5
HD6
HD7
I/O Vss
TEST
XTL Vss
XTL IN
XTL OUT
MD0
MD1
MD2
MD3
MD4
MD5
MD6
MD7
MCE0

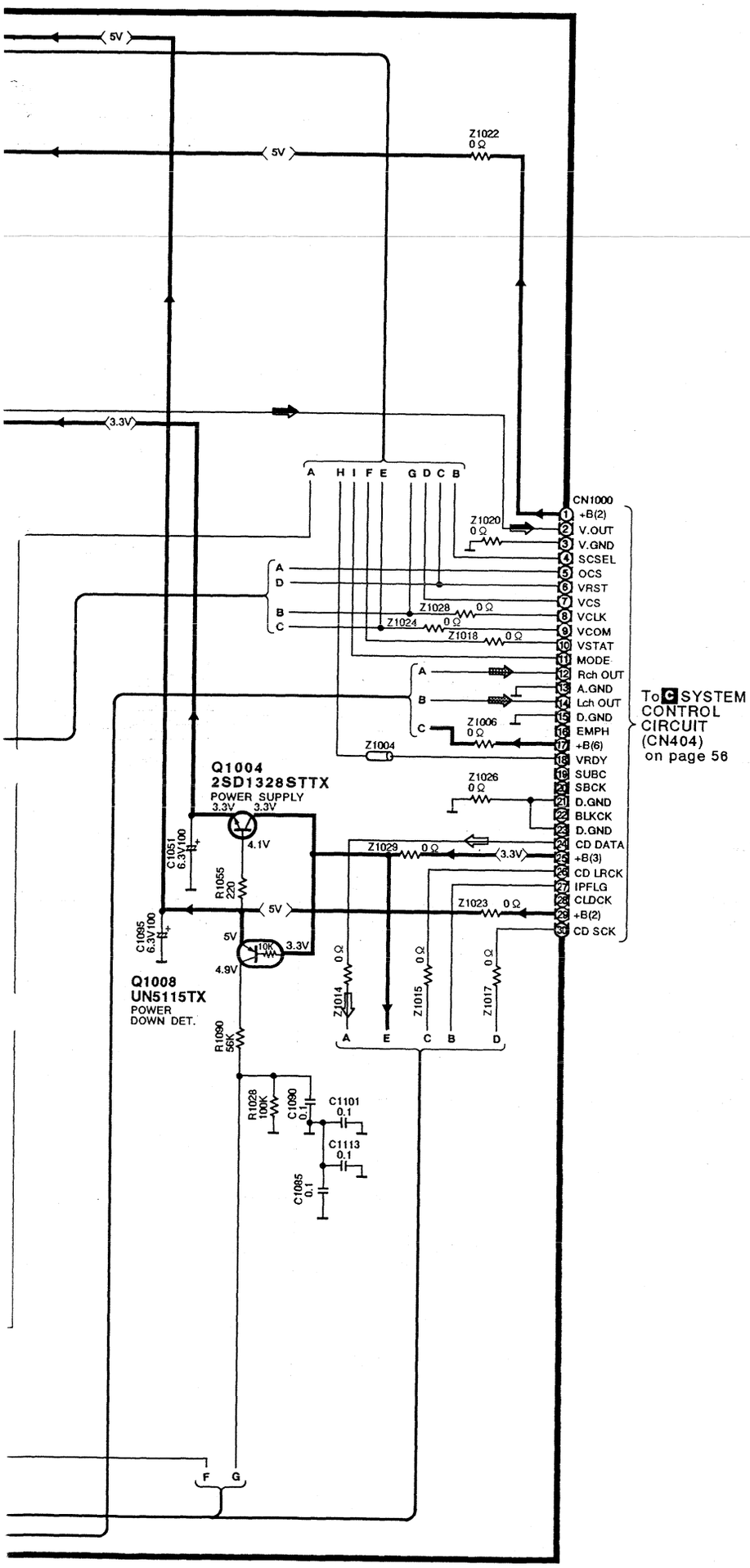
B VIDEO CIRCUIT (P.C.Board:on page 63)

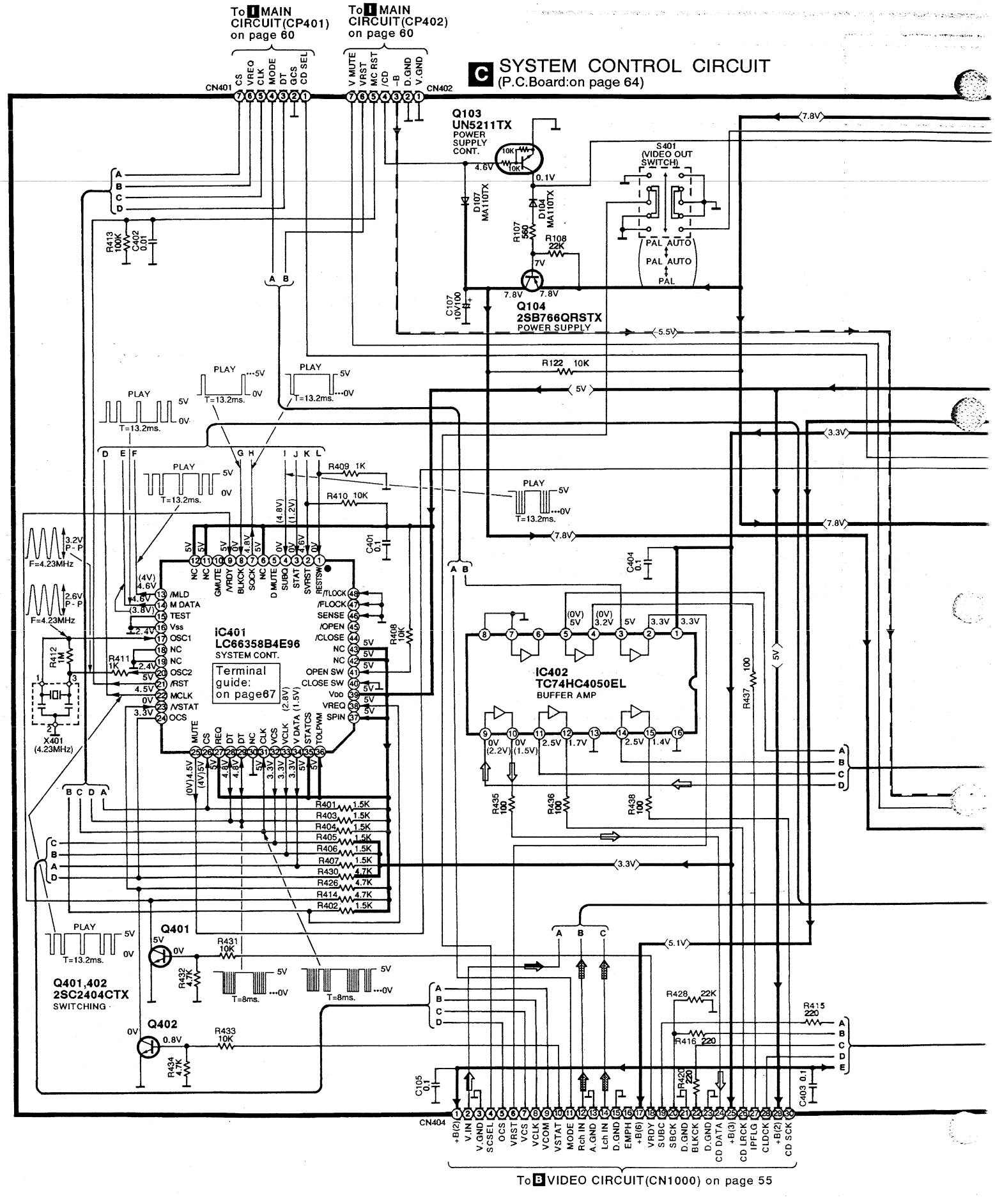


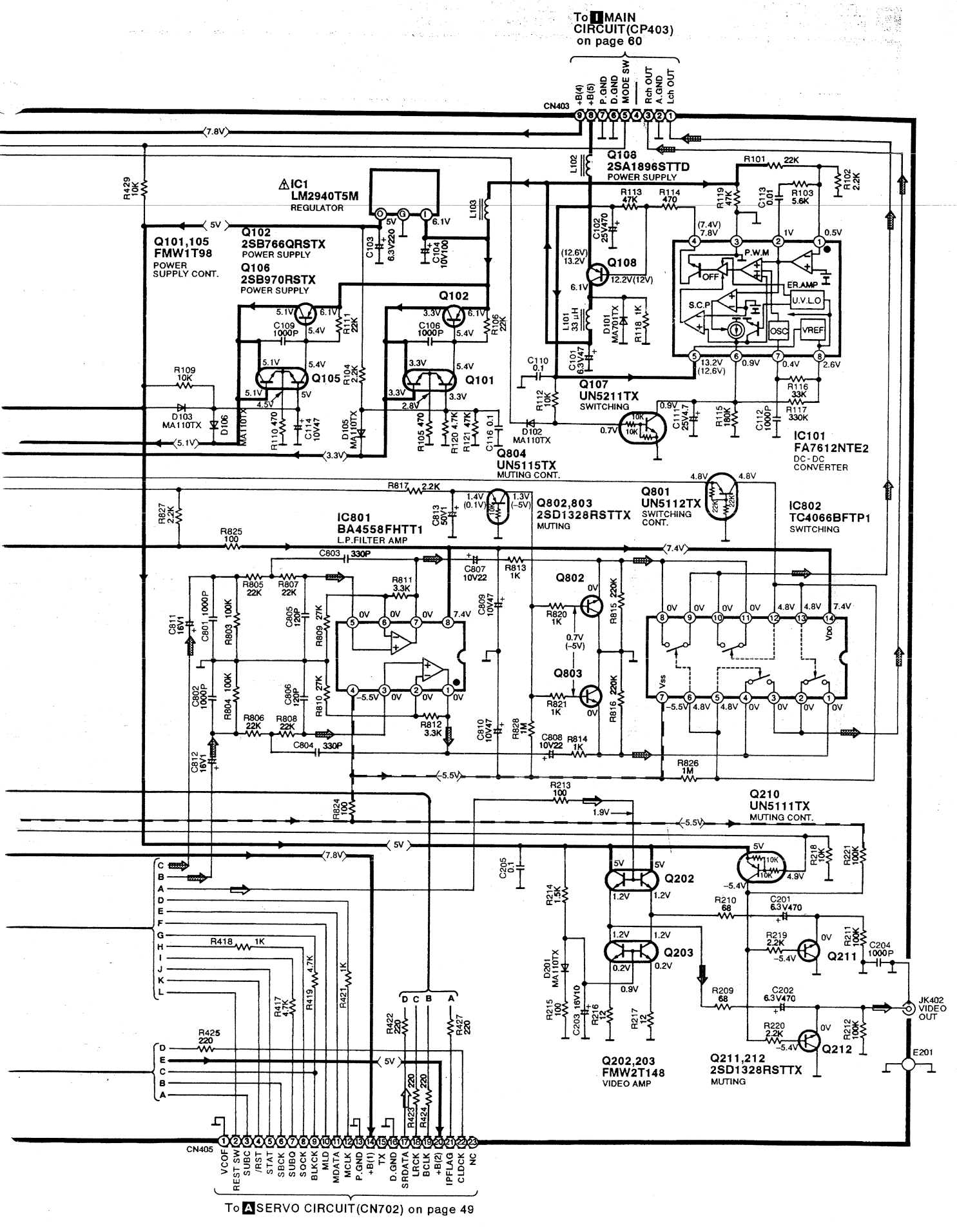

5V
3.3V
5V
IC1009
IC1005
IC1005,1009
MB81426070PJ
4M DRAM
Z1007
0 Ω
C1104
0.1
C1102
0.1
C1034
0.1
C1039
0.1
C1087
1000P
C1061
10P
R1078
1K
F=16.9344MHz
5V
P-P
R1009
47
C1025
0.01
R1013
100
C1028
0.01
C1029
0.01
R1014
100
PLAY
T=23 µs.
T=0.48 µs.
0.5 µs,2V/DIV.
1KHz,0dB
3.6V
P-P
Terminal guide: on page 75
X1004
(16.9MHz)
R1086
100K
D1001
MA304TX
C1004
5P
C1017
1000P
C1024
0.01
C1020
6.3V100
C1030
6.3V100
C1109
0.1
2.1V
P-P
F=16.9MHz
IC1006
MN6475A-T1
DIGITAL FILTER
& D/A CONV.

B VIDEO CIRCUIT (P.C.Board:on page 63)



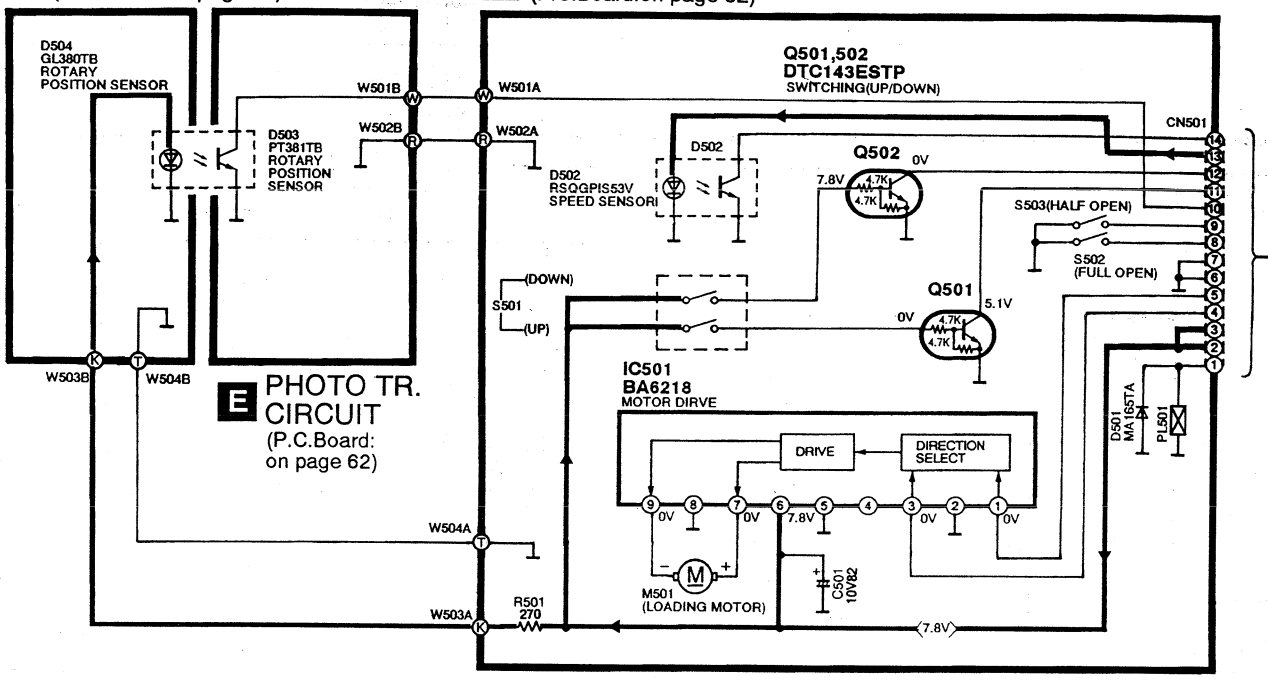

5V
5V
Z1022
0Ω
3.3V
A H I F E G D C B
CN1000
1 +B(2)
2 V.OUT
3 V.GND
4 SCSEL
5 OCS
6 VRST
7 VCS
8 VCLK
9 VCOM
10 VSTAT
11 MODE
12 Rch OUT
13 A.GND
14 Lch OUT
15 D.GND
16 EMPH
17 +B(6)
18 VRDY
19 SUBC
20 SBCK
21 D.GND
22 BLKCK
23 D.GND
24 CD DATA
25 +B(3)
26 CD LRCK
27 IPFLG
28 CLDCK
29 +B(2)
30 CD SCK
Z1020
Z1028
Z1024
Z1018
Z1006
Z1004
Z1026
Z1029
Z1023
To C SYSTEM CONTROL CIRCUIT (CN404) on page 58
Q1004
2SD1328STTX
POWER SUPPLY
3.3V
4.1V
C1051 6.3V100
R1055 220
C1095 6.3V100
10K
4.9V
Q1008
UN5115TX
POWER DOWN DET.
R1090 56K
R1028 100K
C1090 0.1
C1101 0.1
C1113 0.1
C1085 0.1
Z1014
Z1015
Z1017
A E C B D
F G


C SYSTEM CONTROL CIRCUIT
(P.C.Board:on page 64)
To I MAIN CIRCUIT(CP401) on page 60
To I MAIN CIRCUIT(CP402) on page 60
CN401
CN402
CS
VREQ
CLK
MODE
DT
GCS
CD SEL
V MUTE
VRST
MC RST
/CD
-B
D.GND
V.GND
Q103
UN5211TX
POWER SUPPLY CONT.
S401
(VIDEO OUT SWITCH)
PAL AUTO
PAL AUTO
PAL
D107 MA110TX
D104 MA110TX
R107 560
R108 22K
C107 10V/100
Q104
2SB766QRSTX
POWER SUPPLY
7.8V
5.5V
5V
3.3V
R122 10K
R409 1K
R410 10K
C401 0.1
C404 0.1
PLAY
T=13.2ms.
IC401
LC66358B4E96
SYSTEM CONT.
Terminal guide: on page67
/MLD
M DATA
TEST
Vss
OSC1
NC
NC
OSC2
/RST
MCLK
/VSTAT
OCS
/TLOCK
/FLOCK
SENSE
/OPEN
/CLOSE
OPEN SW
CLOSE SW
Vdd
VREQ
SPIN
IC402
TC74HC4050EL
BUFFER AMP
R437 100
R435 100
R436 100
R438 100
X401
(4.23MHz)
F=4.23MHz
3.2V P-P
2.6V P-P
R412 1M
R411 1K
R401 1.5K
R403 1.5K
R404 1.5K
R405 1.5K
R406 1.5K
R407 1.5K
R430 4.7K
R426 4.7K
R414 4.7K
R402 1.5K
Q401
Q402
Q401,402
2SC2404CTX
SWITCHING
R431 10K
R432 4.7K
R433 10K
R434 4.7K
R428 22K
R415 220
R416 220
R420 220
C105 0.1
C403 0.1
CN404
+B(2)
V.IN
V.GND
SCSEL
OCS
VRST
VCS
VCLK
VCOM
VSTAT
MODE
Rch IN
A.GND
Lch IN
D.GND
EMPH
+B(6)
VRDY
SUBC
SBCK
D.GND
BLKCK
D.GND
CD DATA
+B(3)
CD LRCK
IPFLG
CLDCK
+B(2)
CD SCK
To B VIDEO CIRCUIT(CN1000) on page 55


To I MAIN CIRCUIT(CP403) on page 60
CN403
+B(4) +B(5) P.GND D.GND MODE SW Rch OUT A.GND Lch OUT
Q106 2SA1896STTD POWER SUPPLY
IC1 LM2940T5M REGULATOR
Q101,105 FMW1T98 POWER SUPPLY CONT.
Q102 2SB766QRSTX POWER SUPPLY
Q106 2SB970RSTX POWER SUPPLY
Q108 12.2V(12V)
P.W.M
OFF
ER.AMP
U.V.L.O
S.C.P
OSC
VREF
Q105
Q101
Q107 UN5211TX SWITCHING
Q804 UN5115TX MUTING CONT.
IC101 FA7612NTE2 DC-DC CONVERTER
IC801 BA4558FHTT1 L.P.FILTER AMP
Q802,803 2SD1328RSTTX MUTING
Q801 UN5112TX SWITCHING CONT.
IC802 TC4066BFTP1 SWITCHING
Q802
Q803
Vdd
Vss
Q210 UN5111TX MUTING CONT.
Q202
Q203
Q202,203 FMW2T148 VIDEO AMP
Q211
Q212
Q211,212 2SD1328RSTTX MUTING
JK402 VIDEO OUT
E201
CN405
VCOF REST SW SUBC /RST STAT SBCK SUBQ SOCK BLKCK MLD MDATA MCLK P.GND +B(1) TX D.GND SRDATA LRCK BCLK +B(2) IPFLAG CLDCK NC
To A SERVO CIRCUIT(CN702) on page 49

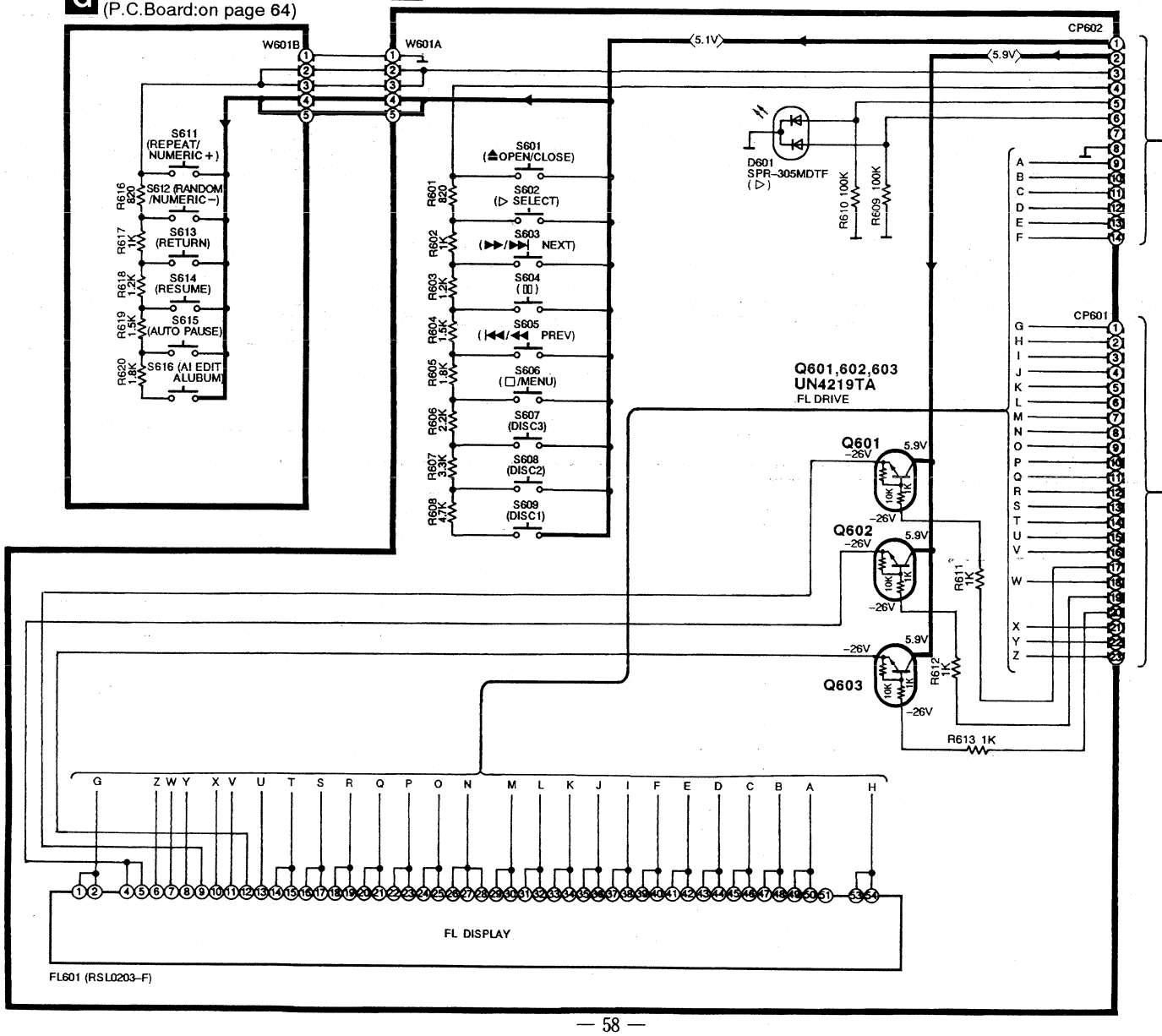
D LED CIRCUIT
(P.C.Board:on page 62)

F LOADING MOTOR CIRCUIT
(P.C.Board:on page 62)

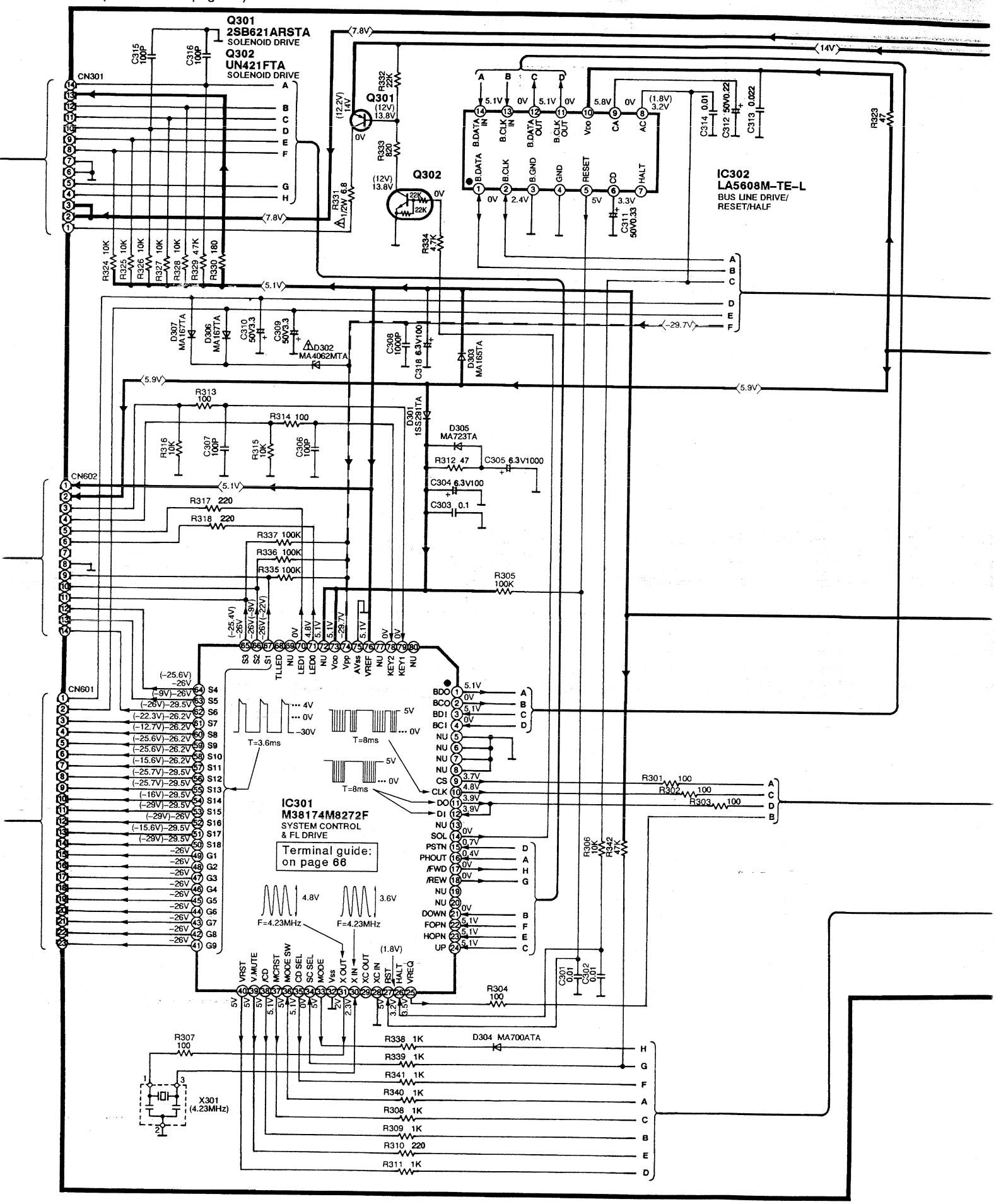


G OPERATION CIRCUIT
(P.C.Board:on page 64)

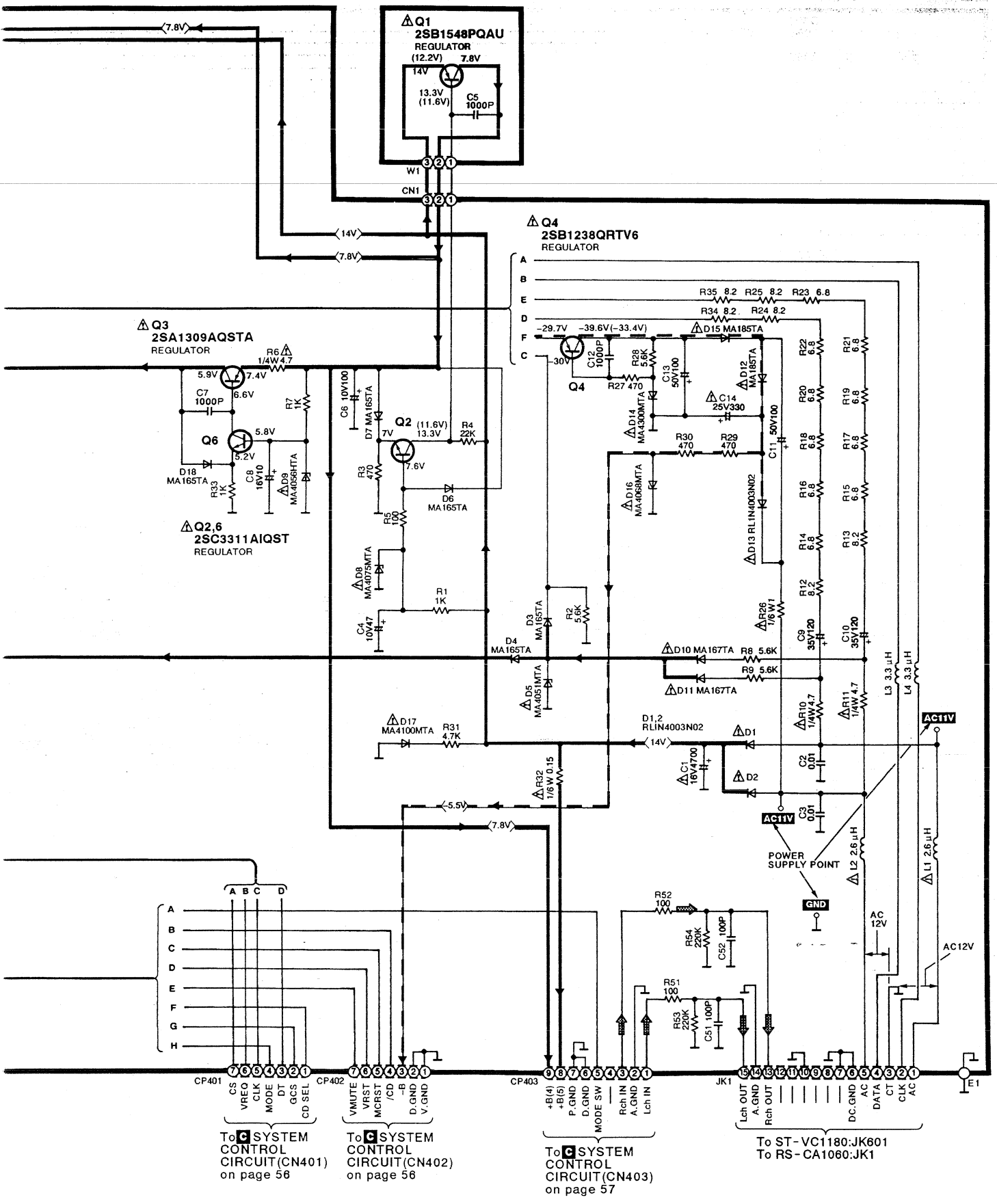
H FL CIRCUIT (P.C.Board:on page 65)



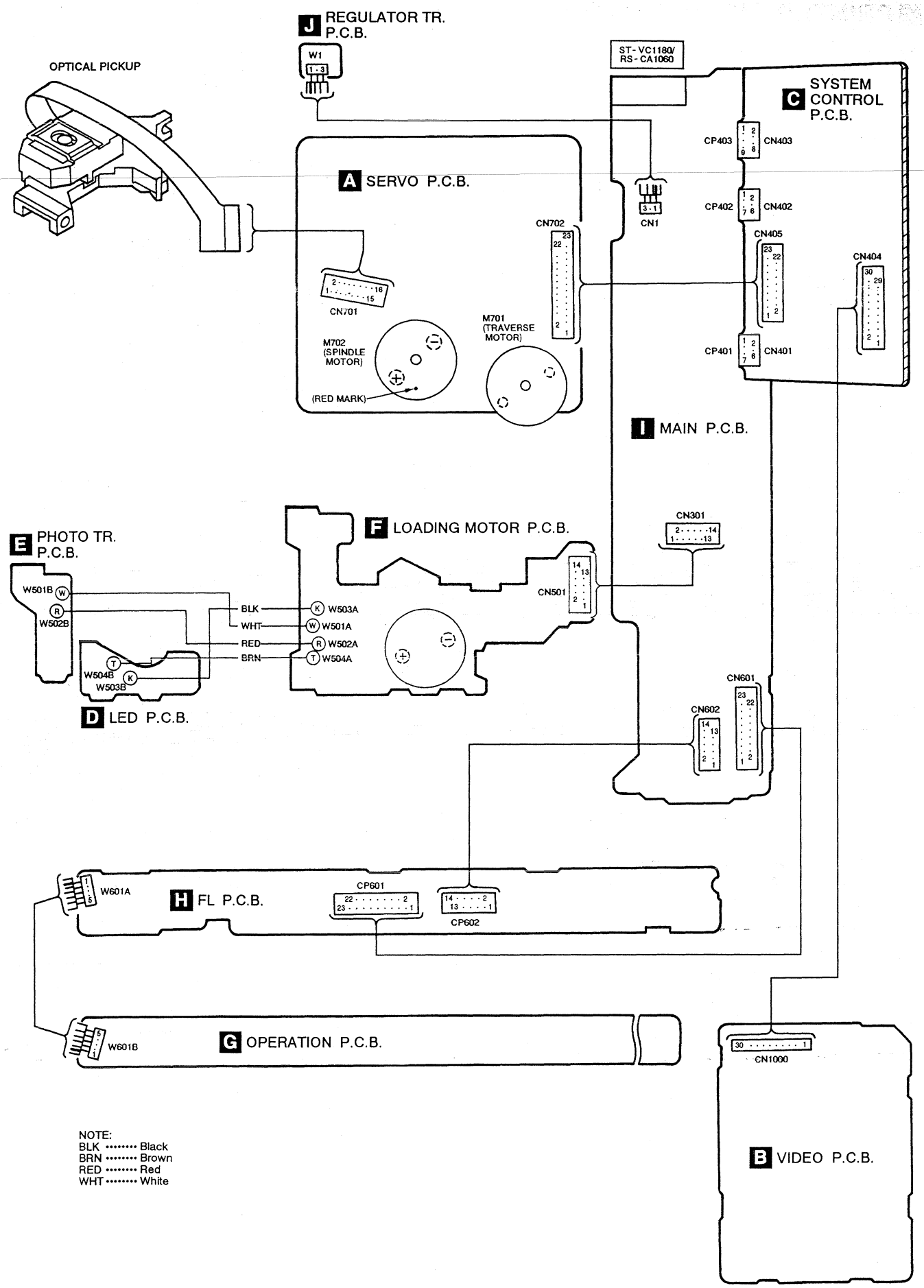
I MAIN CIRCUIT
(P.C.Board:on page 65)



J REGULATOR TR. CIRCUIT
(P.C.Board:on page 62)



■ WIRING CONNECTION DIAGRAM



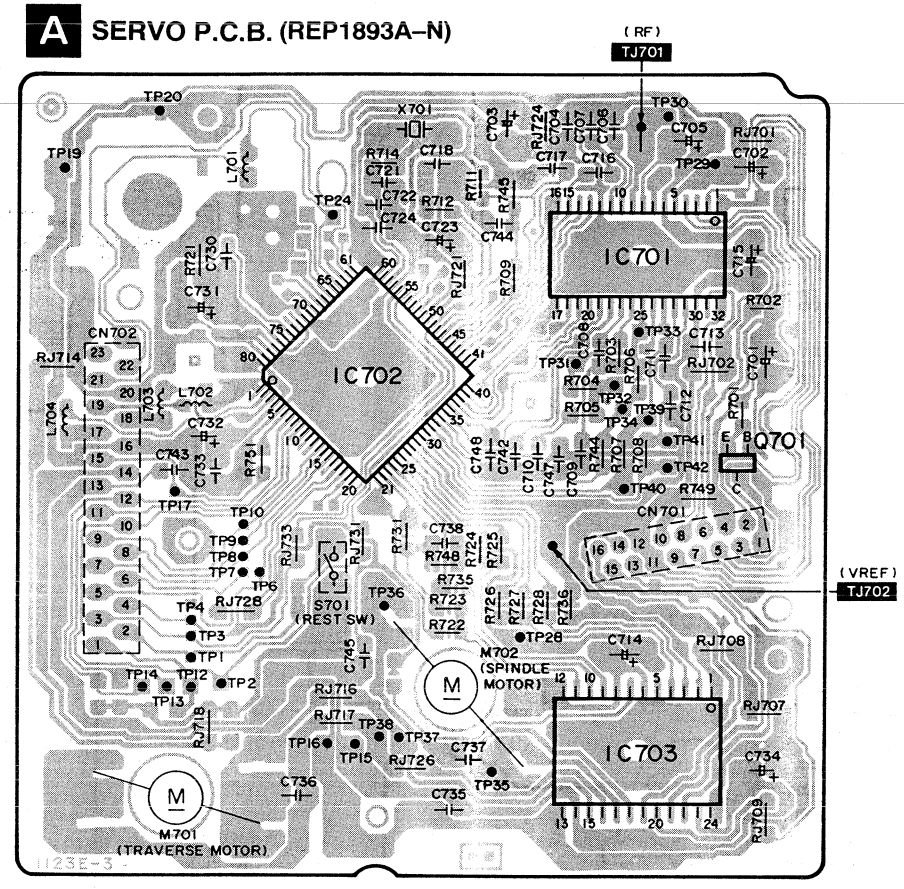
NOTE:
BLK ····· Black
BRN ····· Brown
RED ····· Red
WHT ····· White

■ PRINTED CIRCUIT BOARDS

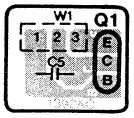
Note:

- This printed circuit boards diagram may be modified at any time with the development of new technology.

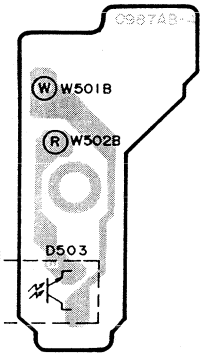
A SERVO P.C.B. (REP1893A–N)



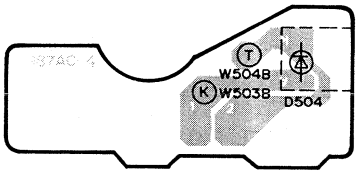
J REGULATOR TR. P.C.B. (REP2097A–2S)



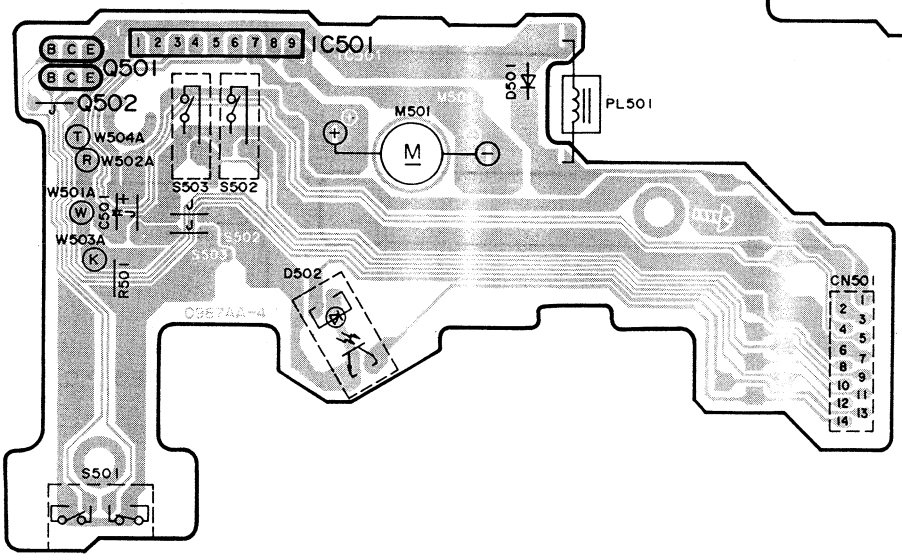
E PHOTO TR. P.C.B. (REP1557B–N)



D LED P.C.B. (REP1557B–N)



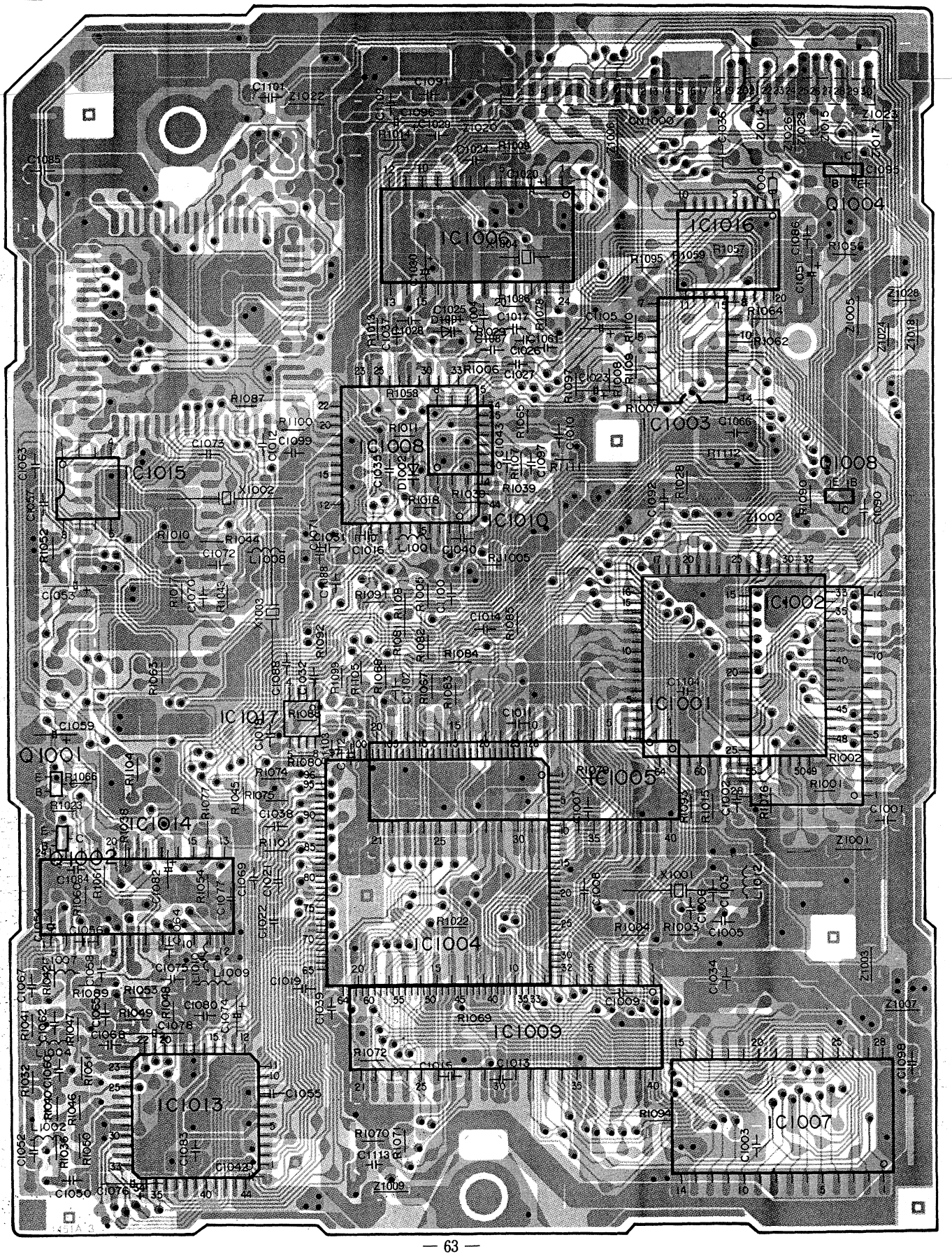
F LOADING MOTOR P.C.B. (REP1557B–N)



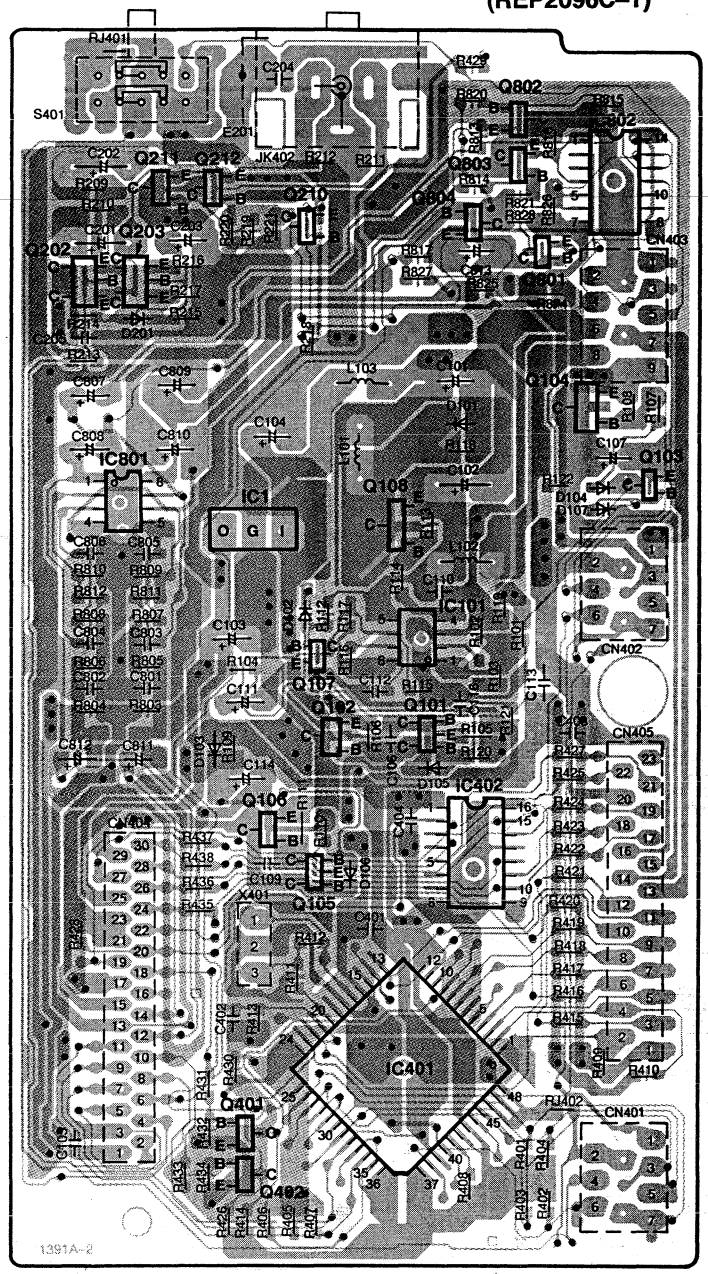
6 7 8 9 10

Notes:
- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black.
  The opposite side is printed in blue.
- The "●" mark denote the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.

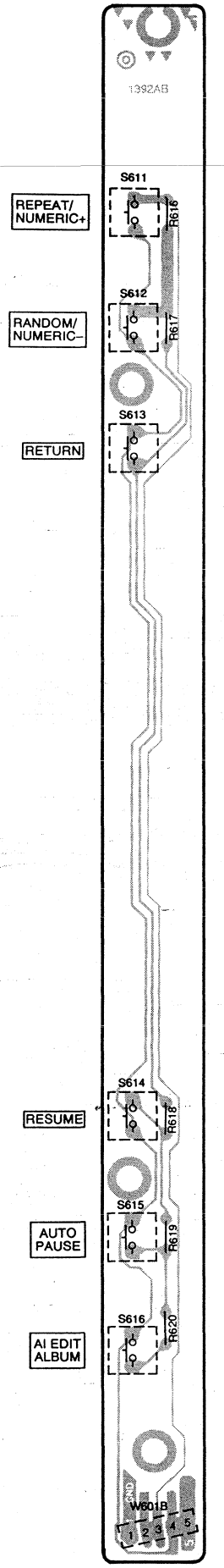
B VIDEO P.C.B. (REP2118H–T)



C SYSTEM CONTROL P.C.B. (REP2096C–T)

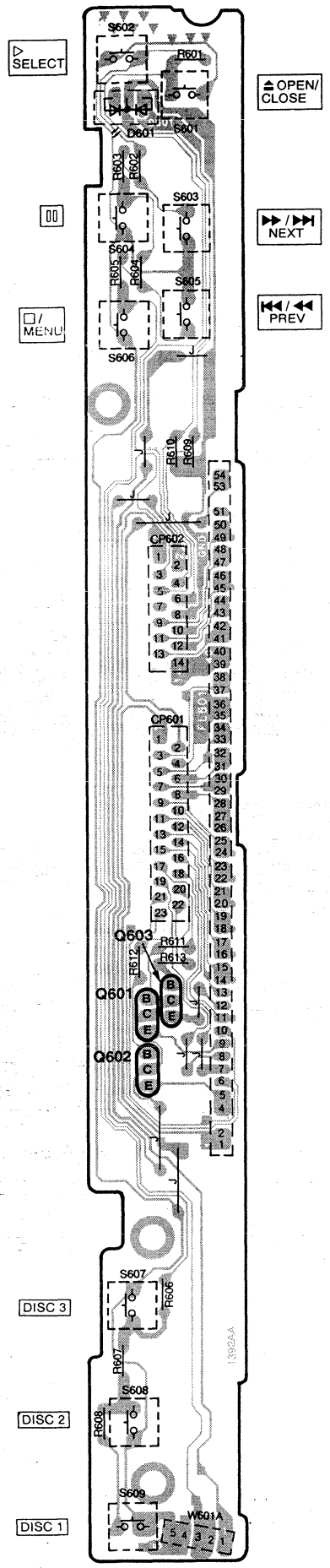


G OPERATION P.C.B. (REP2097A–1S)

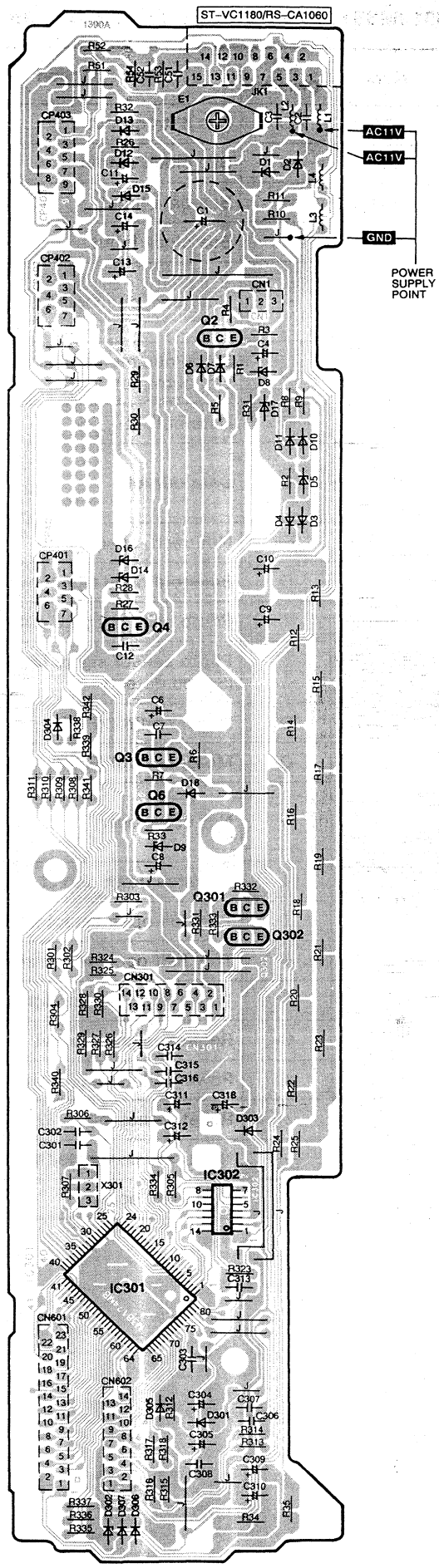


6 7 8 9 10

H FL P.C.B. (REP2097A–1S)



I MAIN P.C.B. (REP2095B–M)



■ TERMINAL GUIDE

• IC301 (M38174M8272F): FL drive & System control

Pin No.	Mark	I/O Division	Function
1	BDO	O	Bus data output
2	BCO	O	Bus clock output
3	BDI	I	Bus data input
4	BCI	I	Bus clock input
5 ∫ 8	NU	—	Not used, connected to GND
9	CS	O	Serial communication starting signal output
10	CLK	O	Data output
11	D0	O	Data output
12	D1		
13	NU	—	Not used, open
14	SOL	O	Solenoid drive signal output
15	PSTN	I	Photo sensor signal output
16	PHOUT	I	Photo sensor signal input (Speed detect)
17	/FWD	O	Motor control (FWD)
18	/REW	O	Motor control (REW)
19	NU	—	Not used, open
20			
21	DOWN	I	Traverse down detect signal input
22	FOPN	I	Tray full open detect signal input
23	HOPN	I	Tray half open detect signal input
24	UP	I	Traverse up detect signal input
25	VREQ	O	Request signal output
26	HALT	I	Power failure detect signal input
27	RST	I	Reset signal input
28	XC IN	—	Not used, connected to GND
29	XC OUT	—	Not used, open

Pin No.	Mark	I/O Division	Function
30	X IN	I	Clock input
31	X OUT	O	Clock output
32	VSS	—	GND terminal
33	MODE	I	NTSC/PAL selection signal
34	SCSEL	I	Not used, connected to GND
35	CDSEL	O	Signal select signal
36	MODESW	I	NTSC/PAL mode det. terminal
37	MCRST	O	Reset control signal output
38	/CD	O	Muting control signal output
39	V. MUTE	O	Muting signal output
40	V RST	O	Reset signal output
41 ∫ 49	G9 ∫ G1	O	FL grid drive signal output
50 ∫ 67	S18 ∫ S1	O	FL segment drive signal output
68	TLLED	—	Not used, open
69	NC	—	Not used, open
70	LED0	O	LED control
71	LED1		
72	NU	—	Not used, power supply terminal
73	VDD	I	Power supply terminal
74	VPP	I	Power supply terminal
75	AVSS	—	GND terminal
76	VREF	O	Reference voltage output
77	NU	—	Not used, open
78	KEY2	I	Operation switch signal input
79	KEY1		
80	NU	—	Not used, open

• IC401 (LC66358B4E96): System control

Pin No.	Mark	I/O Division	Function
1	RESTSW	I	Rest detect terminal
2	SVRST	I	Reset signal input
3	STAT	I	Status signal input
4	SUBQ	I	Subcode Q input
5	DMUTE	—	Not used, open
6	NC	—	Not used, connected to power supply
7	SQCK	O	External clock for subcode Q register
8	BLKCK	I	Subcode block clock input
9	/VRDY	I	Ready signal input
10	GMUTE	—	Not used, open
11	NU	—	Not used, connected to power supply
12			
13	/MLD	O	Microprocessor command load signal
14	MDATA	O	Microprocessor command data
15	TEST	—	Test terminal
16	VSS	—	GND terminal
17	OSC1	I	Crystal oscillator input terminal (F=4.23MHz)
18	NU	—	GND terminal
19			
20	OSC2	O	Crystal oscillator output terminal (F=4.23MHz)
21	/RST	O	Reset signal output
22	MCLK	O	Microprocessor command clock terminal
23	/VSTAT	I	Status data input
24	OSC	I	Chip select signal input

Pin No.	Mark	I/O Division	Function
25	MUTE	O	Muting signal output
26	CS	I	Chip select signal input
27	REQ	I	Request signal input
28	DT	I/O	Data signal input/output terminal
29			
30	NC	—	Not used, connected to GND
31	CLK	I	Clock signal input
32	VCS	O	Chip select signal output
33	VCLK	O	Serial clock signal output
34	VDATA	O	Serial data signal output
35	STATCS	I	Not used, connected to power supply
36	TOLPWM		
37	SPIN		
38	VREQ	I	Request signal input
39	VDD	I	Power supply terminal
40	CLOSESW	I	Disc tray "close" det. terminal
41	OPENSW	I	Disc tray "open" det. terminal
42	NC	—	Not used, connected to power supply
43			
44	/CLOSE	—	Not used, open
45	/OPEN		
46	SENSE	I	Sense signal input terminal (Not used, connected to GND)
47	/FLOCK	I	Focus servo pull-in signal (Not used, connected to GND)
48	/TLOCK	I	Tracking servo pull-in signal (Not used, connected to GND)

• IC701 (AN8802SCE1V): Servo amp

Pin No.	Mark	I/O Division	Function
1	PDAD	I	Photo detector Bch input without delay
2	PDA	I	Photo detector Ach input without delay
3	LPD	I	Laser PD signal
4	LD	O	Laser power auto control output
5	AMPI	I	RF amp terminal
6	V_{CC}	I	Power supply terminal
7	AMPO	O	RF amp signal (Not used, open)
8	CAGC	I	AGC detection capacitor input
9	ARF	O	RF signal
10	CENV	I	RF detect capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	GND	—	GND terminal
13	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
14	TES	I	Tracking error shunt input ("H": shunt)
15	PLAY	I	Play signal ("H": ON, "L": OFF)
16	WVEL	I	Double velocity ("H": double, "L": single)

Pin No.	Mark	I/O Division	Function
17	BDO	O	Dropout detection control
18	/RFDET	O	RF det. signal ("L": det.)
19	CROSS	O	Tracking error zero cross output
20	OFTR	O	Off track detection ("H": det.)
21	VDET	O	Oscillation det. signal ("H": det.)
22	ENV	O	Envelope output terminal
23	TEBPF	I	Oscillation detect input terminal
24	TE	O	Tracking error signal
25	FE	O	Focusing error signal
26	PTO	O	Potention amp output (Not used, open)
27	PTI	I	Potention amp input (Not used, open)
28	TBAL	I	Tracking balance adj. input
29	FBAL	I	Focus balance adj. input
30	VREF	O	Reference voltage output
31	PDB	I	Photo detector Ach input with delay
32	PDBD	I	Photo detector Bch input with delay

• IC703 (AN8389SE1): Focus coil/tracking coil/traverse motor/spindle motor drive

Pin No.	Mark	I/O Division	Function
1	V_{CC}	I	Power supply terminal
2	VREF	I	Reference voltage input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	GND terminal
6	NC	—	Not used, connected to GND
7	NRESET	O	Reset terminal (Not used, open)
8	GND	—	GND terminal
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
13	$PV_{CC}1$	I	Driver power supply (1)
14	PGND1	—	Driver GND terminal (1)
15	D1−	O	Motor driver (1) output terminal (−)
16	D1+	O	Motor driver (1) output terminal (+)
17	D2−	O	Motor driver (2) output terminal (−)
18	D2+	O	Motor driver (2) output terminal (+)
19	D3−	O	Motor driver (3) output terminal (−)
20	D3+	O	Motor driver (3) output terminal (+)
21	D4−	O	Motor driver (4) output terminal (−)
22	D4+	O	Motor driver (4) output terminal (+)
23	PGND2	—	Driver GND terminal (2)
24	$PV_{CC}2$	I	Driver power supply (2)

• IC702 (MN662740RE): Servo processor/digital signal processor/digital filter/D/A converter

Pin No.	Mark	I/O Division	Function
1	BCLK	O	Serial bit clock output
2	LRCK	O	L/R discriminating signal output
3	SRDATA	O	Serial data signal output
4	$DV_{DD}1$	I	Power supply (digital circuit) terminal
5	$DV_{SS}1$	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal
7	MCLK	I	Command clock signal
8	MDATA	I	Command data signal
9	MLD	I	Command load signal ("L": LOAD)
10	SENSE	—	Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG) (Not used, open)
11	/FLOCK	—	Optical servo condition (focus) ("L": lead-in) (Not used, open)
12	/TLOCK	—	Optical servo condition (tracking) ("L": lead-in) (Not used, open)
13	BLKCK	O	Sub-code block clock (f=75Hz)
14	SQCK	I	Sub-code Q register clock
15	SUBQ	O	Sub-code Q data
16	DMUTE	I	Muting input ("H": MUTE) (Not used, connected to GND)
17	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)
18	/RST	I	Reset signal ("L": reset)
19	SMCK	O	System clock (f=4.2336MHz) (Not used, open)
20	PMCK	O	Frequency division clock signal ($f=\frac{1}{1.92}\times ck=88.2kHz$) (Not used, open)
21	TRV	O	Traverse servo control
22	TVD	O	Traverse drive signal
23	PC	O	Turntable motor drive signal ("L": ON)
24	ECM	O	Turntable motor drive signal (Forced mode)
25	ECS	O	Turntable motor drive signal (Servo error signal)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive signal output
28	FOD	O	Focus drive signal output
29	VREF	I	D/A drive output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal

Pin No.	Mark	I/O Division	Function
30	FBAL	O	Focus balance adj. output
31	TBAL	O	Tracking balance adj. output
32	FE	I	Focus error signal (analog input)
33	TE	I	Tracking error signal (analog input)
34	RFENV	I	RF envelope signal
35	VDET	I	Oscillation det. signal ("H": det.)
36	OFT	I	Off track signal ("H": Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal ("L": detection)
39	BDO	I	Dropout detection signal ("H": droput)
40	LDON	O	Laser power control ("H": ON)
41	TES	O	Tracking error shunt output ("H": dropout)
42	PLAY	O	Play signal ("H": play)
43	WVEL	O	Double velocity status signal ("H": double)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	—	DSL bias terminal (Not used, open)
47	DSLF	I/O	DSL loop filter terminal
48	PLLF	I/O	PLL loop filter terminal
49	VCOF	I	VCO loop filter terminal (Not used, connected to $AV_{DD}2$)
50	$AV_{DD}2$	I	Power supply (analog circuit) terminal (2)
51	$AV_{SS}2$	—	GND (analog circuit) terminal
52	EFM	O	384fs (16.9344MHz) output (Not used, open)
53	PCK	—	PLL extract clock (f=4.3218MHz) (Not used, open)
54	PDO	—	Tracking servo OFF signal (Not used, open)
55	SUBC	O	Sub-code serial output data
56	SBCK	I	Sub-code serial input clock
57	V_{SS}	—	GND terminal
58	X1	I	Crystal oscillator terminal (f=16.9344MHz)
59	X2	O	
60	V_{DD}	I	Power supply terminal
61	BYTCK	O	Traverse motor stop control terminal (Not used, open)

Pin No.	Mark	I/O Division	Function
62	/CLDCK	O	Sub-code frame clock signal (f CLDCK=7.35kHz: Normal)
63	FCLK	O	Crystal frame clock (Not used, open)
64	IPFLAG	O	Interpolation flag terminal
65	FLAG	—	Flag terminal (Not used, open)
66	CLVS	—	Turntable servo phase synchro signal ("H": CLV, "L": Rough servo) (Not used, open)
67	CRC	—	Sub-code CRC check terminal ("H": OK, "L": NG) (Not used, open)
68	DEMPH	—	DE-emphasis ON signal ("H": ON) (Not used, open)
69	RFSY	O	Flag terminal (Not used, open)
70	/RST2	I	Not used, connected to power supply
71	/TEST	I	Test terminal (Normal: "H") (Not used connected to power supply)

Pin No.	Mark	I/O Division	Function
72	$AV_{DD}1$	I	Power supply (analog circuit) terminal (1)
73	OUTL	O	Lch audio signal (Not used, open)
74	$AV_{SS}1$	—	GND (analog circuit) terminal (1)
75	OUTR	O	Rch audio signal (Not used, open)
76	RSEL	I	Polarity direction control terminal of RF signal (Not used connected to power supply)
77	CSEL	I	Frequency control terminal of crystal oscillator (Not used, connected to GND)
78	PSEL	I	Serial data signal input (Not used, connected to GND)
79	MSEL	I	L/R discriminating signal input (Not used, connected to GND)
80	SSEL	I	Serial bit clock input (Not used connected to power supply)

• IC1001 (M38002M2308F): Sub-Micro computer

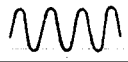
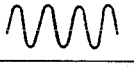
Pin No.	Mark	I/O Division	Function description	Remarks
1	HSEL3	O	Data/address mode selection output	Accepts a Mode Switching signal for HD0~HD7 (address/data I/O lines)
2	HSEL2/CLOCK	O	Data/address mode selection output	Accepts a Mode Switching signal for HD0~HD7 (address/data I/O lines)
3	HSEL1/DATA	O	Data/address mode selection output	Accepts a Mode Switching signal for HD0~HD7 (address/data I/O lines)
4 ∫ 11	HD7 ∫ HD0	I/O	Address/data I/O lines	Used to exchange address or data with the MPEG video/audio decoder. Address is transferred in one direction from IC1001 to IC1004. Data is transferred in both directions between IC1001 and IC1004
12	VRDY	I	Ready signal input	When set to Low, communication with VCOM and VSTAT of system controller (IC401) is enabled
13	VCK	I	Video clock input	Used to clock VCOM (command data) and VSTAT (status data) transfers. When set to Low, communication with VCOM and VSTAT is enabled
14	VSTAT	O	Status data output	Supplies the system controller (IC401) with status data
15	VCOM	I	Command data input	Receives command data from the system controller (IC401)
16	VCS	I	Chip select signal input	Transferred from the system controller (IC401)
17	INT	I	Soft Interrupt signal output	Receives Soft Interrupt signal from the MPEG video/audio decoder (IC1004)
18	CNV_{SS}	—	GND terminal	0V
19	$\overline{RESET}$	I	Reset signal	Active low reset input from FL drive & the system controller (IC301)

Pin No.	Mark	I/O Division	Function description	Remarks
20	G. RST	O	CD-G Reset signal	Not used, open
21	MUTE/BBCNT	O	Blue Back Control signal output	When a high signal is supplied to the timing generator (IC1010), the screen turns entirely blue
22	XIN	I	CD bit clock input	Clock input from the timing generator (IC1010)
23	XOUT	O	——	Not used, open
24	VSS	—	GND terminal	0V
25 ∫ 32	P2-7/DB7 ∫ P2-0/DB0	I/O	8-bit parallel data I/O lines	Data I/O from/to the 64K SRAM (IC1002)
33 34	P1-7/AD15 P1-6/AD14	O	Address output	Supply the 64K SRAM (IC1002) with address information
35	P1-5/AD13	O	——	Not used, open
36 ∫ 48	P1-4/AD12 ∫ P0-0/AD0	O	Address output	Supply the 64K SRAM (IC1002) with address information
49	P3-7/$\overline{RD}$	O	Read control output	When set to Low, data is read out of the 64K SRAM (IC1002)
50	P3-6/$\overline{WR}$	O	Write control output	When set to Low, data is read out of the 64K SRAM (IC1002)
51	P3-5/SYNC	—	——	Not used, open
52	P3-4/CLK	—	——	Not used, open
53	P3-3/$\overline{RESETOUT}$	—	——	Not used, open
54	P3-2/$\overline{ONW}$	I	ON_WAIT input	Used to insert a wait cycle into CPU cycle
55	SCSEL0	O	NTSC/PAL selection signal output	MODEO / SCSELO: PAL AUTO: H / L; PAL: L / L; NTSC: — / H. *When SCSELO is High, NTSC is selected no matter whether MODEO is High or Low
56	MODE0	O		
57	VCC	I	Power supply terminal	3.3V
58	SCSEL	I	NTSC/PAL selection signal input	MODE / SCSEL: PAL AUTO: H / L; PAL: L / L; NTSC: — / H. *When SCSEL is High, NTSC is selected no matter whether MODE is High or Low
59	MODE	I		
60	CDNFMV	O	CD-DA audio line/video CD line selection signal output	High: Selects CD-DA Low: Selects video CD
61	CDGM	I	——	Not used connected to resistor
62	DTACK	I	Data Acknowledge signal input	Data acknowledgement from MPEG (IC1004) received in response to data output to MPEG
63	R/W	O	Read/write control output	Controls address or data read/write operations performed with MPEG (IC1004)
64	DS	O	Data Strobe signal output	When set to Low, address or data is exchanged with MPEG (IC1004) through HD0~HD7

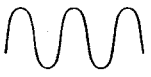
• IC1004 (MN89101AM): MPEG Video decoder

Pin No.	Mark	I/O Division	Function description	Remarks
1	HA2	I	Data/address mode switching input	Used to switch the mode for HD0~HD7 (address/data I/O) lines
2	$\overline{DS}$	I	Data Strobe signal input	When set to Low, address or data is read/written from/to the sub-microcomputer (IC1001) to/from HD0~HD7
3	R/$\overline{W}$	I	Read/Write signal input	Read/write signal Low=read, High=write
4	CFLEVEL	—	——	Not used, open
5	$\overline{DTACK}$	O	Data Acknowledge signal output	This signal is output to IC1001 when data is received from IC1001 to HD0~HD7
6	HD0	I/O	Address/data I/O	Used to exchange address or data between IC1001 and IC1004
7	VDD	I	Power supply terminal	3.3V
8	HD1	I/O	Address/data I/O	Used exchange address or data between IC1001 and IC1004. Address is transferred only in one direction from IC1001 to IC1004. Data is transferred in both directions between IC1001 and IC1004 (IC1004's status is transferred to IC1001, commands are transferred from IC1001 to IC1004)
9	HD2	I/O	Address/data I/O	
10	V_{SS}	—	GND terminal	0V
11 ∫ 15	HD3 ∫ HD7	I/O	Address/data I/O	Used exchange address or data between IC1001 and IC1004. Address is transferred only in one direction from IC1001 to IC1004. Data is transferred in both directions between IC1001 and IC1004
16	I/O V_{SS}	—	GND terminal	0V
17	TEST	I	——	Not used, connected to power supply
18	XTL V_{SS}	—	GND for crystal resonator	0V
19	XTL IN	I	Crystal resonator terminals	F=40.5MHz (T=0.0247μs)
20	XTL OUT	O		
21, 22	VDD	I	Supply input for crystal resonator	3.3V
23 ∫ 28	MD0 ∫ MD5	I/O	DRAM/ROM data I/O lines	Used to exchange data with DRAM (IC1005, IC1009) and ROM (IC1007). Data used to control MPEG (IC1004) is transferred from ROM, while video data with CD-ROM format comes from DRAM
29	VDD	I	Power supply terminal	3.3V
30	MD6	I/O	DRAM/ROM data I/O lines	Used exchange data with DRAM (IC1005, IC1009) and ROM (IC1007)
31	MD7			
32	$\overline{MCE0}$	O	ROM Chip Enable signal output	Low selects ROM (IC1007)
33	MCE1	—	——	Not used, open
34 ∫ 37	MD8 ∫ MD11	I/O	DRAM data/ROM address I/O lines	Used to exchange data with DRAM (IC1005, IC1009) and ROM (IC1007)
38	V_{SS}	—	GND terminal	0V
39 ∫ 42	MD12 ∫ MD15	I/O	DRAM data/ROM address I/O lines	Used to exchange data with DRAM (IC1005, IC1009) and ROM (IC1007)
43	$V_{DD}5$	I	Power supply terminal	4.7V

Pin No.	Mark	I/O Division	Function description	Remarks
44	$\overline{\text{LCAS}}$	O	DRAM LCAS/ROM address output	Lower address/data command output for DRAM (IC1005, IC1009)
45	$\overline{\text{LCAS IN}}$	I	DRAM LCAS input	Lower address/data command intput for DRAM (IC1005, IC1009)
46	V_{SS}	—	GND terminal	0V
47	$\overline{\text{MWE}}$	O	DRAM Write Enable signal output	Low writes to IC1005 and IC1009. High reads from IC1005 and IC1009
48	$\overline{\text{UCAS}}$	O	DRAM UCAS/ROM address output	Higher address/data command output for DRAM (IC1005, IC1009)
49	V_{DD}	I	Power supply terminal	3.3V
50	$\overline{\text{UCAS IN}}$	I	DRAM UCAS input	Higher address/data command intput for DRAM (IC1005, IC1009)
51	$\overline{\text{RAS0}}$	O	DRAM RAS0 output	Higher address output for DRAM (IC1009)
52	$\overline{\text{RAS1}}$	O	DRAM RAS1 output	Higher address output for DRAM (IC1005)
53	MA9	O	ROM chip enable signal output	Low selects ROM (IC1007)
54 ∫ 57	MA8 ∫ MA5	O	DRAM/ROM address output	Address output for DRAM (IC1005, IC1009)
58	V_{SS}	—	GND terminal	0V
59 ∫ 63	MA4 ∫ MA0	O	DRAM/ROM address output	Address output for DRAM (IC1005, IC1009)
64	PIO 0	—	——	Not used, open
65	VDD	I	Power supply terminal	3.3V
66 ∫ 72	VD0 ∫ VD6	O	Video data output (red)	Video data output (red) to VDAC (IC1013)
73	V_{SS}	—	GND terminal	0V
74 ∫ 76	VD7 ∫ VD9	O	Video data outputs Pin 74: Red Pins 75~76: Green	Video data outputs (red and green) to VDAC (IC1013)
77	VDD	I	Power supply terminal	3.3V
78 ∫ 80	VD10 ∫ VD12	O	Video data output (Green)	Video data output (green) to VDAC (IC1013)
81	VDD	I	Power supply terminal	3.3V
82 ∫ 84	VD13 ∫ VD15	O	Video data output (Green)	Video data output (green) to VDAC (IC1013)
85	V_{SS}	—	GND terminal	0V
86 ∫ 89	VD16 ∫ VD19	O	Video data output (blue)	Video data output (blue) to VDAC (IC1013)
90	V_{SS}	—	GND terminal	0V
91 ∫ 94	VD20 ∫ VD23	O	Video data output (blue)	Video data output (blue) to VDAC (IC1013)
95	CSYNC	O	Composite Sync. signal output	Output to the timing generator (IC1010) and RGB encoder (IC1014) (F=15.7kHz: NTSC, F=15.6kHz: PAL)

Pin No.	Mark	I/O Division	Function description	Remarks
96	HSYNC	O	Horizontal Sync. signal output	Output to the timing generator (IC1010) and OSD (IC1016) (F=15.7kHz: NTSC, F=15.6kHz: PAL)
97	VOE	I	Video Enable signal input	Not used connected to power supply
98	VCO V_{DD}	I	Power supply terminal	3.3V
99	VCLK	I	Video read clock input	 F=27MHz (T=0.037μs)
100	VCO V_{SS}	—	GND terminal	0V
101	$\overline{\text{RESET}}$	I	Reset signal input	Active low reset signal from the system controller (IC401)
102	V_{SS}	—	GND terminal	0V
103	CD-C2PO	I	Data Error Flag signal input	Accepts a flag signal when serial data error is uncorrectable
104	CD-LRCK	I	CD LR clock input	F=87kHz (T=11.5μs)
105	CD-DATA	I	CD serial data input	F=2.822MHz (T=0.354μs)
106	CD_BCK	I	CD bit clock input	F=2.822MHz (T=0.354μs)
107	DA-LRCK	O	Audio LR clock input	F=87kHz (T=11.5μs)
108	DA-DATA	O	Audio serial data output	F=2.822MHz (T=0.354μs)
109	DA-BCK	O	Audio bit clock output	F=2MHz (T=0.5μs)
110	VDD	—	Power supply terminal	3.3V
111	XCK	I	Audio read clock input	 F=16.9344MHz (T=0.059μs)
112	VDD	I	Power supply terminal	3.3V
113	PI12	O	Soft interrupt signal output	Issued when IC1004 wants to transfer its own information to the sub-microcomputer (IC1001)
114	PI11	—	——	Not used, open
115	PI10	I	Host Enable signal input	Raised to high level
116	PI09	I	Boot ROM Enable signal input	Raised to high level
117	PI08	—	——	Not used, open
118	PI07	O	DAC emphasis output	High frequency emphasis signal output
119 ∫ 122	PI06 ∫ PI03	—	——	Not used, open
123	VDD5	I	Power supply terminal	4.7V
124	PI02	—	——	Not used, open
125	Vss	—	GND terminal	0V
126	PI01	—	——	Not used, open
127	HA0	I	Data/address mode switching input	Used to switch the mode for HD0~HD7 (address/data I/O) lines
128	HA1	I	Data/address mode switching input	Used to switch the mode for HD0~HD7 (address/data I/O) lines

• IC1006 (MN6475A-T1): Digital filter and D/A converter

Pin No.	Mark	I/O Division	Function description	Remarks
1	LRCLK	I	Left/right channel discrimination selection	Left channel: H Right channel: L
2	BCLK	I	Bit clock input for serial data	Clock signal from MPEG video decoder (IC1004)
3	SRDATA	I	Serial data input	Data signal from MPEG video decoder (IC1004)
4	COT1	O	Signal selection (Not used connected to GND)	COT1 / COT2 / Selection signal L / L / Normal, stereo output L / H / Left channel output H / L / Right channel output H / H / Reversed left and right channel outputs
5	COT2	O		
6	TEST	—	Test terminal	Normally L (connected to ground)
7	DV_{DD}	I	Digital system power supply	5V
8	X2	O	External clock input/output	 F=16MHz
9	X1	I		
10	DV_{SS}	—	Digital system ground	0V
11	$AV_{DD}L$	I	Left channel analog system power supply	5V
12	OUTL	O	Left channel analog signal output	Audio signal
13	$AV_{SS}L$	—	Left channel analog system ground	0V
14	$AV_{SS}R$	—	Right channel analog system ground	0V
15	OUTR	O	Right channel analog signal output	Audio signal
16	$AV_{DD}R$	I	Right channel analog system power supply	5V
17	$\overline{RESET}$	I	Reset input	Reset on: L
18	PWM	O	Output for testing LSI	Not used and open
19	TP	—	Output for testing LSI	Connected to ground
20	WVEL	I	Internal operation mode switching	Connected to power supply
21	DEMPH	I	Digital de-emphasis on/off	De-emphasis on: H
22	CSEL	I	Clock output frequency selection (for COUT terminal)	Frequency-divides external clock signal 1/4 frequency-division: L 1/2 frequency-division: H
23	192FS	O	Frequency-division clock output (192Fs)	Not used and open
24	384FS	O	External clock output	Clock signal for timing generator (IC1010) (384Fs=16.9344MHz)

• IC1010 (BU12102-0D): Timing generator

Pin No.	Mark	I/O Division	Function description	Remarks
1	GND	—	GND terminal	0V
2	VOSCI	I	Video clock OSC input	F=27MHz (T=0.037µs)
3	VOSCO	O	Video clock OSC output	
4	VDD	I	Power supply terminal	3.3V
5	VCLK	O	Video clock output	F=27MHz (T=0.037µs)
6	DCLK	O	Pixel clock output	F=13.5MHz (T=0.074µs)
7	OCLK	O	TV screen character display clock output	F=6.75MHz (T=0.148µs)
8	$\overline{\text{HSYNC}}$	I	Horizontal Sync. signal input	F=15.7kHz (T=63.5µs) (NTSC) F=15.6kHz (T=64µs) (PAL)
9	$\overline{\text{CSYNC}}$	I	Composite Sync. signal input	F=15.7kHz (T=63.5µs) (NTSC) F=15.6kHz (T=64µs) (PAL)
10	PDOWN	I	Power Down signal input	Active low selects power down mode
11	FSC	O	Subcarrier signal output	Subcarrier signal output to the RGB encoder (IC1014) (F=3.58MHz: NTSC, F=4.43MHz: PAL)
12	VDD	I	Power supply terminal	3.3V
13	POSCI	I	Crystal OSC circuit input	F=17.734475MHz (PAL) (T=0.6µs)
14	POSCO	O	Crystal OSC circuit output	
15	NOSCI	I	Crystal OSC circuit input	F=14.31818MHz (NTSC) (T=0.07µs)
16	NOSCO	O	Crystal OSC circuit output	
17	GND	—	GND terminal	0V
18	4FSC	O	Frequency output 4 times the subcarrier frequency	F=14.31818MHz (T=0.07µs) (NTSC) F=17.734475MHz (T=0.06µs) (PAL)
19	$\overline{\text{VSYNC}}$	O	Vertical Sync. signal output	Vertical Sync. signal output to the OSC (IC1016)
20	PALID	O	——	Not used, open
21	SWCNT	O	Switch Control signal output	Signal output to the switch IC (IC1015)
22	CDNFMV	I	CD-DA audio line/video CD line switching signal input	Switching signal from the sub-microcomputer (IC1001)
23	XCK	O	Reference signal output	F=16.9344MHz (T=0.059µs)
24	GND	—	GND terminal	0V
25	XOSCO	O	Reference signal generator output	F=16.9344MHz (T=0.059µs)
26	XOSCI	I	Reference signal genarator input	
27	VDD	I	Power supply terminal	3.3V
28	XPC	O	Reference signal phase comparator output	SCK (Serial data bit clock) frequency is compared with one sixth the XCK (reference signal) frequency to lock the SCK frequency
29	FSSEL	I	GND terminal	0V
30	SCKI	I	Serial data bit clock input	F=2.822MHz (T=0.354µs)
31	AIN	I	L/R Discrimination signal input	F=87kHz (T=11.5µs)

Pin No.	Mark	I/O Division	Function description	Remarks
32	BIN	I	Data Error Flag signal input	Accepts a flag signal when serial data error is uncorrectable
33	CIN	I	Serial data input	Serial data from the servo processor (IC702)
34	GND	—	GND terminal	0V
35	COUT	O	CD serial data output	Serial data output to MPEG video/audio decoder (IC1004)
36	BOUT	O	Data Error Flag signal output	Accepts a flag signal when serial data error is uncorrectable
37	AOUT	O	CD LR clock output	F=87kHz (T=11.5µs)
38	SCKOUT	O	CD bit clock	F=2.822MHz (T=0.354µs)
39	VDD	I	Power supply terminal	3.3V
40	BBOUT	O	Blue back output	Applied to analog blue data input of RGB encoder
41	BBCNT	I	Blue back control signal input	Control signal from the sub-CPU. The screen turns entirely blue when this signal is high
42	SESEL	I	NTSC/PAL Selection signal input	MODE / SCSEL: PAL AUTO: H / L; PAL: L / L; NTSC: — / H. *NTSC is selected when SCSEL is high, no matter whether MODE is High or Low
43	MODE	I		
44	VPC	O	Video clock phase comparator output	/HSYNC (horizontal sync.) frequency is compared with 4FSC (4 times the subcarrier frequency) to lock the former to the latter

• IC1013 (MN6570TF): D/A Converter (video)

Pin No.	Mark	I/O Division	Function description	Remarks
1 ∫ 4	DG4 ∫ DG1	I	Pixel (green) output (bits 1~4)	Pixel signals from MPEG video decoder (IC1004)
5	CLKG	I	Pixel (green) clock input	Clock signal (F=13.5MHz) from timing generator (IC1010)
6	DV_{SS}	—	Ground	0V
7	DV_{DD}	I	Digital system power supply	4.7V
8 ∫ 15	DB8 ∫ DB1	I	Pixel (blue/chrominance) output (bits 2~7)	Pixel signals from MPEG video decoder (IC1004)
16	CLKR	I	Pixel (red) clock input	Clock signal (F=13.5MHz) from timing generator (IC1010)
17 • 18	AV_{DD}	I	Analog power supply	4.7V
19	IREF	I	Internal reference current	Connected to power supply via a 1kΩ resistance
20	VREF	I	Internal reference voltage	Connected in parallel to power supply and ground via a 2.2kΩ resistance
21	COMP	I	Time constant setting	1µF capacitor between terminal and power supply
22	VIB	I	Time constant setting	0.1µF capacitor connected between terminal and ground
23	IOB	O	Analog RGB (blue) output	RGB signal for RGB encoder (IC1014)

Pin No.	Mark	I/O Division	Function description	Remarks
24	NC	—	Not connected	Connected to ground
25	IOG	O	Analog RGB (green) output	RGB signal for RGB encoder (IC1014)
26	NC	—	Not connected	Connected to ground
27	IOR	O	Analog RGB (red) output	RGB signal for RGB encoder (IC1014)
28 • 29	AV_{SS}	—	Ground	0V
30 ∫ 37	DR8 ∫ DR1	I	Pixel (red/luminance) input (bits 1~8)	Pixel signals from MPEG video decoder (IC1004)
38	CLKB	I	Pixel (blue) clock input	Clock signal (F=13.5MHz) from timing generator (IC1010)
39	DV_{SS}	—	Ground	0V
40	DV_{DD}	I	Power supply	4.7V
41 ∫ 44	DG8 ∫ DG5	I	Pixel (green) input (bits 0~3)	Pixel signals from MPEG video decoder (IC1004)

• IC1014 (CXA1645M): RGB encoder

Pin No.	Mark	I/O Division	Function description	Remarks
1	GND1	—	Ground	0V
2	RIN	I	Analog RGB (red) input	RGB signal from VDAC (IC1013)
3	GIN	I	Analog RGB (green) input	RGB signal from VDAC (IC1013)
4	BIN	I	Analog RGB (blue) input	RGB signal from VDAC (IC1013)
5	NC	—	Not connected	——
6	SCIN	I	Subcarrier input	Subcarrier signal (F=3.58MHz) from timing generator (IC1010)
7	NPIN	I	NTSC/PAL mode switching	NTSC: "H" PAL: "L"
8	BFOUT	O	Output for BF pulse monitor	Not used and open
9	YCLPC	I	Y signal clamp time constant	0.1μF capacitor connected between terminal and ground
10	CSYNC IN	I	Composite sync signal When L (≦0.8V): Sync period	Sync signal from timing generator (IC1010)
11	NC	—	Not connected	Not used and open
12	$V_{CC}1$	I	Power supply	5V
13	IREF	I	Internal reference current	47kΩ resistance connected between terminal and ground
14	VREF	I	Internal reference voltage	10μF capacitor connected between terminal and ground
15	COUT	O	Chroma signal output	Not used and open
16	YOUT	O	Y signal output	Not used and open
17	YTRAP	I	Cross color power supply regulated by subcarrier frequency component of Y signal	Not used and open

Pin No.	Mark	I/O Division	Function description	Remarks
18	FO	O	Frequency adjust (fo) for internal filter	Resistance connected between terminal and ground in accordance with mode NTSC: 20kΩ (±1%) PAL: 16kΩ (±1%)
19	$V_{CC}2$	I	Power supply	4.6V
20	CVOUT	O	Composite video signal output	Video signal from a video CD
21	BOUT	O	Analog RGB signal output	Not used and open
22	GOUT	O	Analog RGB signal output	Not used and open
23	ROUT	O	Analog RGB signal output	Not used and open
24	GND 2	—	Ground	0V

• IC1016 (M35040056FPT): OSD

Pin No.	Mark	I/O Division	Function description	Remarks
1	OSC1	I	External network I/O for display OSC	The display OSC's oscillation frequency determines the horizontal display position and character width on the TV screen. OSC2 is not used and left open
2	OSC2	O		
3	$\overline{CS}$	I	Chip select input	Set to Low during serial data transfer. Hysteresis input with internal pull-up resistor
4	SCK	I	Serial clock input	The SIN input reads serial data at the rising edge of SCK when the /CS input is low. Hysteresis input with internal pull-up resistor
5	SIN	I	Serial data input	Accepts data and address for the display control register and display data memory. Hysteresis input with internal pull-up resistor
6	$\overline{AC}$	I	Auto clear input	Clears the IC's internal logics when set to Low. Hysteresis input with internal pull-up resistor
7 ∫ 10	P6 ∫ P9	O	——	Not used open
11	V_{SS}	—	GND terminal	0V
12	P0	O	Port 0 output	Outputs TV screen display character control signal to pin 4 of the video selector (IC1015)
13 ∫ 16	P1 ∫ P4	O	——	Not used open
17	P5	O	Port 5 output	Outputs TV screen display character data to pin 5 of the video selector (IC1015)
18	HOR	I	Horizontal Sync. input	Hysteresis input to accept H. Sync. signal from the MPEG video decoder (IC1004)
19	VERT	I	Vertical Sync. input	Hysteresis input to accept V. Sync. signal from the Timing generator (IC1010)
20	V_{DD}	—	Power supply terminal	3.3V

■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*Warning: This product uses a laser diode. Refer to caution statements on page 3.
*ACHTUNG: Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen einc vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC1	LM2940T5	REGULATOR	⚠
IC101	FA7612NTE2	DC/DC CONVERTER	
IC301	M38174M8272F	FL DRIVE&SYSTEM CONTROL	
IC302	LA5608M-TE-L	BUS LINE/HALT/RESET	
IC401	LC66358B4E96	SYSTEM CONTROL	
IC402	TC74HC4050EL	BUFFER AMP	
IC501	BA6218	MOTOR DRIVE	
IC801	BA4558FHTT1	L. P. FILTER AMP	
IC802	TC4066BFTP1	SWITCHING	
IC1001	M38002M2308F	SUB MICRO COMPUTER	
IC1002	LH5168N8	64K SRAM	
IC1003	TC74HCT7007A	BUFFER AMP	
IC1004	MN89101AM	MPEG VIDEO DECODER	
IC1005	MB81426070PJ	4M DRAM	
IC1006	MN6475A-T1	DIGITAL FILTER&D/A CONV.	
IC1007	LH5317Y1	512K PROM	
IC1008	NJM2115MT1	VCO CONT	
IC1009	MB81426070PJ	4M DRAM	
IC1010	BU12102-0D	TIMING GENERATOR	
IC1013	MN6570TF	VIDEO DAC	
IC1014	CXA1645M	R. G. B. ENCODER	
IC1015	MM1227XFF	SIGNAL SELECTOR	
IC1016	M35040056FPT	OSD	
IC1017	TC7W14FUTE1L	SCHMITT TRIGGER INVERTER	
		TRANSISTOR(S)	
Q1	2SB1548PQAU	TRANSISTOR	⚠
Q2	2SC3311AIQST	TRANSISTOR	⚠
Q3	2SA1309A-R	TRANSISTOR	⚠
Q4	2SB1238QRTV6	TRANSISTOR	⚠
Q6	2SC3311AIQST	TRANSISTOR	⚠
Q101	FMW1T98	TRANSISTOR	
Q102	2SB766-QRSTX	TRANSISTOR	
Q103	UN5211TX	TRANSISTOR	
Q104	2SB766-QRSTX	TRANSISTOR	
Q105	FMW1T98	TRANSISTOR	
Q106	2SB970RSTX	TRANSISTOR	
Q107	UN5211TX	TRANSISTOR	
Q108	2SA1896STTD	TRANSISTOR	
Q202, 203	FMW2T148	TRANSISTOR	
Q210	UN5111TX	TRANSISTOR	
Q211, 212	2SD1328QRSTX	TRANSISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
Q301	2SB621A-R	TRANSISTOR	
Q302	UN421FTA	TRANSISTOR	
Q401, 402	2SC2404C	TRANSISTOR	
Q501, 502	DTC143ESTP	TRANSISTOR	
Q601-603	UN4219TA	TRANSISTOR	
Q801	UN5112TX	TRANSISTOR	
Q802, 803	2SD1328QRSTX	TRANSISTOR	
Q804	UN5115TX	TRANSISTOR	
Q1001, 1002	2SD1819QRSTX	TRANSISTOR	
Q1004	2SD1328-S	TRANSISTOR	
Q1008	UN5115TX	TRANSISTOR	
		DIODE(S)	
D1, 2	RL1N4003N02	DIODE	⚠
D3, 4	MA165	DIODE	
D5	MA4051MTA	DIODE	⚠
D6, 7	MA165	DIODE	
D8	MA4075MTA	DIODE	⚠
D9	MA4056HTA	DIODE	⚠
D10, 11	MA167	DIODE	⚠
D12	MA185TA	DIODE	⚠
D13	RL1N4003N02	DIODE	⚠
D14	MA4300M	DIODE	⚠
D15	MA185TA	DIODE	⚠
D16	MA4068M	DIODE	⚠
D17	MA4100MTA	DIODE	⚠
D18	MA165	DIODE	
D101	MA701TX	DIODE	
D102-107	MA110TX	DIODE	
D201	MA110TX	DIODE	
D301	1SS291TA	DIODE	
D302	MA4062MTA	DIODE	⚠
D303	MA165	DIODE	
D304	MA700	DIODE	
D305	MA723TA	DIODE	
D306, 307	MA167	DIODE	
D501	MA165	DIODE	
D502	RSQGP1S53V	DIODE	
D503	PT381TB	PHOTO TRANSISTOR	
D504	GL380TB	L. E. D.	
D601	SPR-305MDTF	L. E. D.	
D1001, 1002	MA304TX	DIODE	
		COIL(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
L1, 2	BL02RN2R65T2	COIL	⚠
L3, 4	ELEXT3R3KA9	COIL	
L101	RLQB330KT-M	COIL	
L102, 103	RLL500050T-Y	COIL	
L1001	RLQM2R2KT2-W	COIL	
L1002	RLQM121JT2-W	COIL	
L1004	RLQM121JT2-W	COIL	
L1007	RLQM121JT2-W	COIL	
L1008-1010	RLQU220KT-W	COIL	
L1012	RLQM1R8KT2-W	COIL	
		COMPONENT COMBINATION(S)	
Z1004	RLBN102V-Y	COMPONENT COMBINATION	
		OSCILLATOR(S)	
X301	EF0EC4234T3	OSCILLATOR(4.2336MHz)	
X401	EF0EC4234T3	OSCILLATOR(4.2336MHz)	
X1001	RSXZ40M5S01T	OSCILLATOR(40.5MHz)	
X1002	RSXC14M3S03M	OSCILLATOR(14.3MHz)	
X1003	RSXC17M7S02M	OSCILLATOR(17.7MHz)	
X1004	RSXZ16M9H01T	OSCILLATOR(16.9MHz)	
		DISPLAY TUBE(S)	
FL601	RSL0203-F	DISPLAY TUBE	
		SWITCH(ES)	
S401	RSS3B33ZA-H	VIDEO OUT	
S501	RSH2A001-2	UP/DOWN DETECTOR	
S502	RSH1A005	FULL OPEN DETECTOR	
S503	RSH1A005	HALF OPEN DETECTOR	
S601	EVQ21405R	OPEN/CLOSE	
S602	EVQ21405R	PLAY(SELECT)	
S603	EVQ21405R	F.SKIP(NEXT)	
S604	EVQ21405R	PAUSE	
S605	EVQ21405R	R.SKIP(PREV)	
S606	EVQ21405R	STOP(MENU)	
S607	EVQ21405R	DISC3	
S608	EVQ21405R	DISC2	
S609	EVQ21405R	DISC1	
S611	EVQ21405R	REPEAT(NUMERIC+)	
S612	EVQ21405R	RANDOM(NUMERIC-)	
S613	EVQ21405R	RETURN	
S614	EVQ21405R	RESUME	
S615	EVQ21405R	AUTO PAUSE	
S616	EVQ21405R	AI EDIT, ALBUM	
		CONNECTOR(S) AND SOCKET(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN1	RJS1A1703	CONNECTOR(3P)	
CN301	RJS1A6814	CONNECTOR(14P)	
CN401	RJU063W07T	SOCKET(7P)	
CN402	RJU063W07T	SOCKET(7P)	
CN403	RJU063W09T	SOCKET(9P)	
CN404	RJS30Q11ZA	CONNECTOR(30P)	
CN405	RJS1A6823	CONNECTOR(23P)	
CN501	RJS1A6714	CONNECTOR(14P)	
CN601	RJS1A6823	CONNECTOR(23P)	
CN602	RJS1A6814	CONNECTOR(14P)	
CN1000	RJS2A0630T	CONNECTOR(30P)	
CP401	RJT063W07T	CONNECTOR(7P)	
CP402	RJT063W07T	CONNECTOR(7P)	
CP403	RJT063W09T	CONNECTOR(9P)	
CP601	RJS1A6223-1	CONNECTOR(23P)	
CP602	RJS1A6214-1	CONNECTOR(14P)	
		JACK(S) AND TERMINAL(S)	
JK1	RJT065K15	SYSTEM CONNECTOR(15P)	
JK402	SJF3068-8N	VIDEO OUT	
		GND PLATE(S)	
E1	SNE1004-2	GND PLATE	
E201	RSC0081	GND PLATE	
		<SERVO P.C.B.>	
		INTEGRATED CIRCUIT(S)	
IC701	AN8802SCE1V	SERVO AMP	
IC702	MN662740RE	SERVO PROCESSOR	
IC703	AN8389SE1	MOTOR DRIVE	
		TRANSISTOR(S)	
Q701	2SB709S	TRANSISTOR	
		COIL(S)	
L701-704	RLBN102V-Y	COIL	
		OSCILLATOR(S)	
X701	RSXB16M9J01T	OSCILLATOR(16.9344MHz)	
		SWITCH(ES)	
S701	RSM0006-P	REST DETECTOR	
		CONNECTOR(S) AND SOCKET(S)	

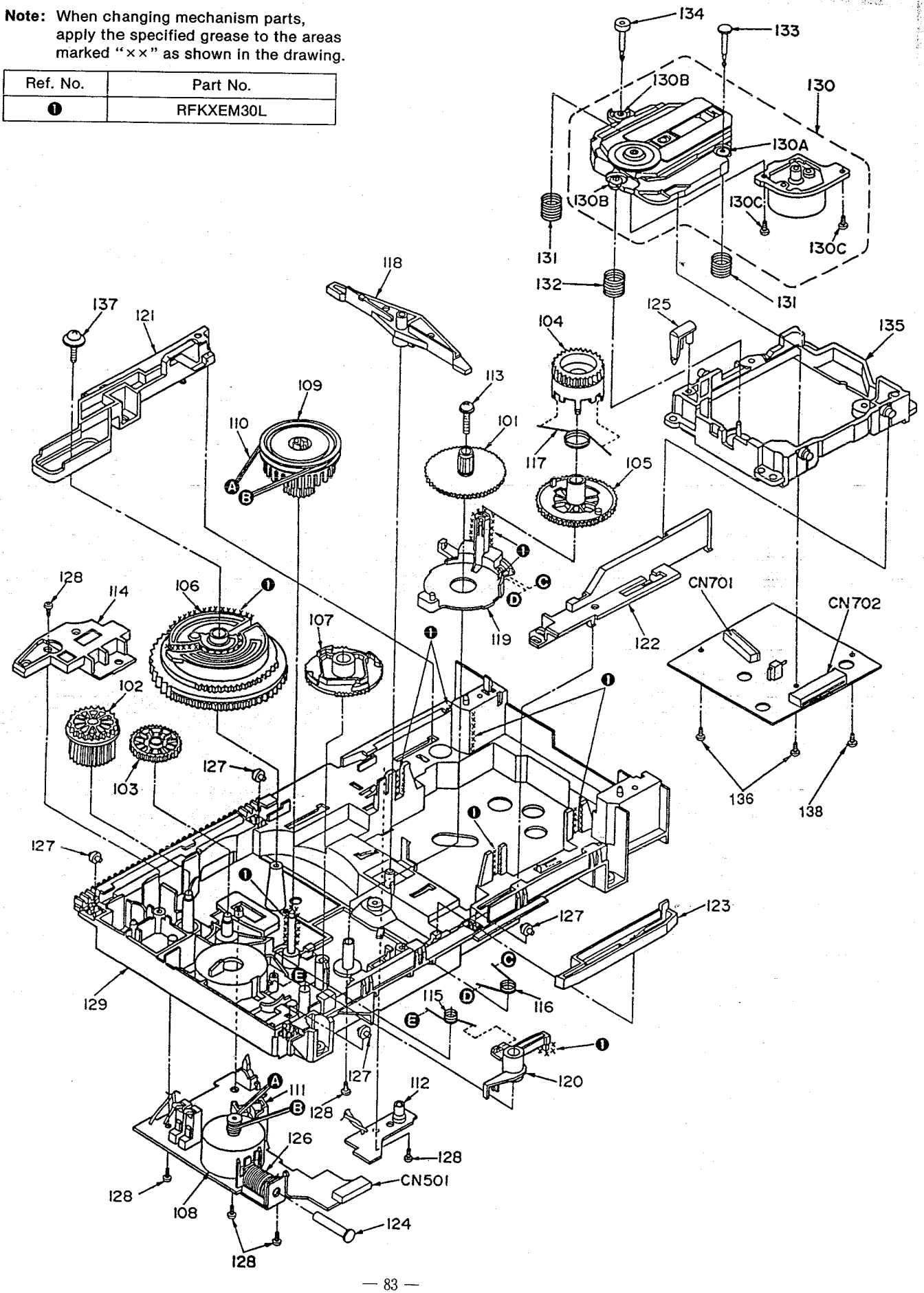
Ref. No.	Part No.	Part Name & Description	Remarks
CN701	RJU035T016-1	SOCKET(16P)	
CN702	RJS1A6723-1Q	CONNECTOR(23P)	

Ref. No.	Part No.	Part Name & Description	Remarks
		LOADING MECHANISM	
101	RDG0194-1	REDUCTION GEAR	
102	RDG0223	DRIVE GEAR(A)	
103	RDG0224	DRIVE GEAR(B)	
104	RDG0244	IDLE GEAR(A)	
105	RDG0245	IDLE GEAR(B)	
106	RDK0022	DRIVE CAM GEAR	
107	RDK0023	SELECT CAM GEAR	
108	RFKPLCH555PK	LOADING MOTOR(M501) ASS'Y	
109	RDP0058	PULLY GEAR	
110	RDV0025	BELT	
111	RMN0204	SENSOR HOLDER	
112	RMN0222	LED HOLDER	
113	RHD26014	SCREW	
114	RMA0653	ANGLE	
115	RME0120	SOLENOID SPRING	
116	RME0121	SPRING	
117	RME0137	GEAR SPRING	
118	RML0177	LEVER	
119	RML0288	GEAR LEVER	
120	RML0289	SOLENOID LEVER	
121	RMM0097	SLIDE PLATE(1)	
122	RMM0098	SLIDE PLATE(2)	
123	RMM0099	SLIDE PLATE(3)	
124	RMS0398	SOLENOID CORE	
125	RMX0072	SLIDER	
126	RSJ0003	SOLENOID	
127	RMR0701-K	ROLLER	
128	XTB3+10JFZ	SCREW	
129	RFKJLCH555PB	MECHANISM CHASSIS ASS'Y	
130	RAE0113Z	TRAVERSE DECK ASS'Y	
130A	SHGD112	FLOATING RUBBER(1)	
130B	SHGD113-1	FLOATING RUBBER(2)	
130C	SNSD38	SCREW	
131	RME0109	FLOATING SPRING(1)	
132	RME0142	FLOATING SPRING(2)	
133	RMS0123-1	TRAVERSE FIXED PIN(1)	
134	RMS0350	TRAVERSE FIXED PIN(2)	
135	RMR0698-K	TRAVERSE CHASSIS	
136	XTV2+6G	SCREW	
137	RHD30046	SCREW	
138	XTN2+6G	SCREW	

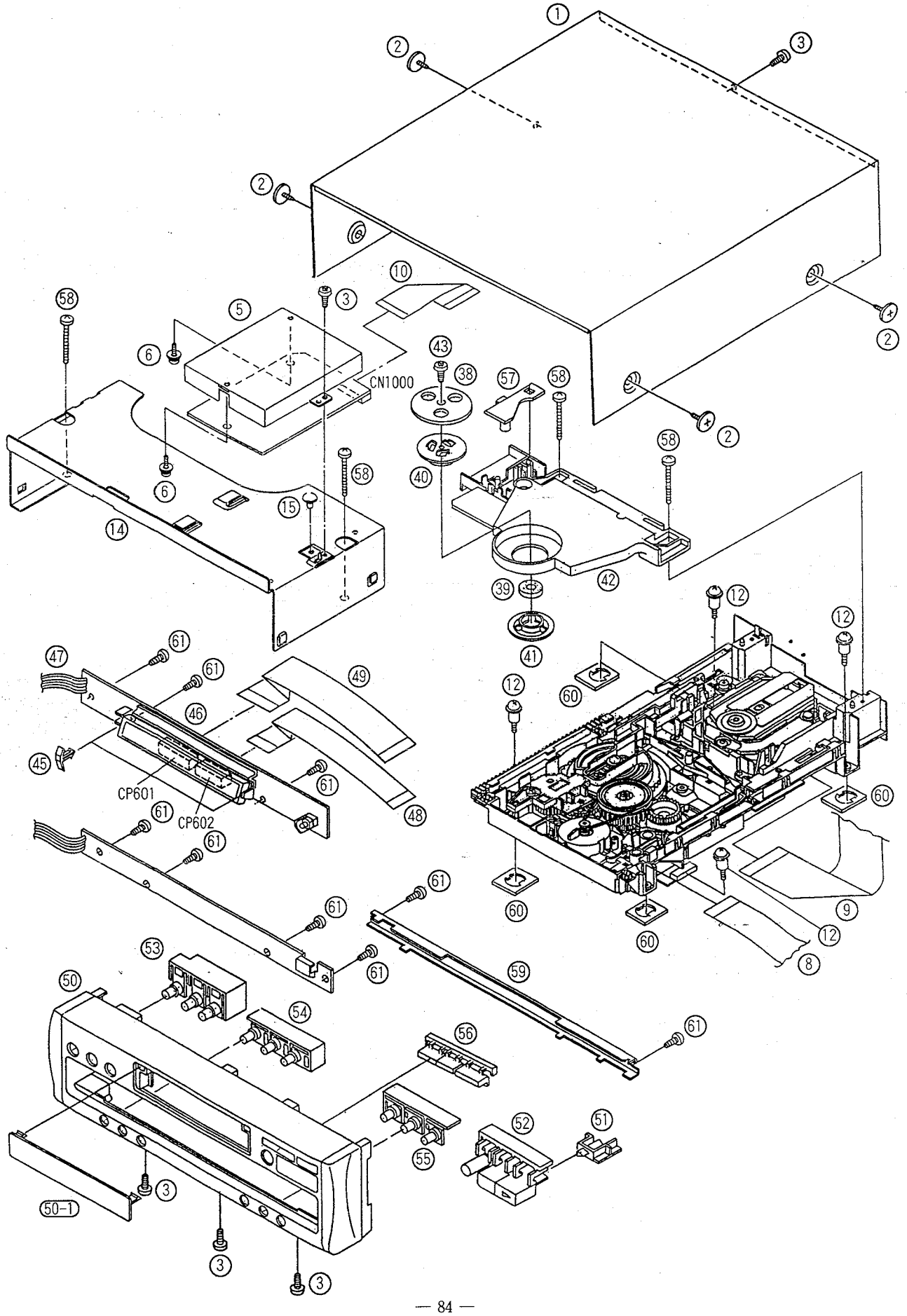
■ LOADING MECHANISM PARTS

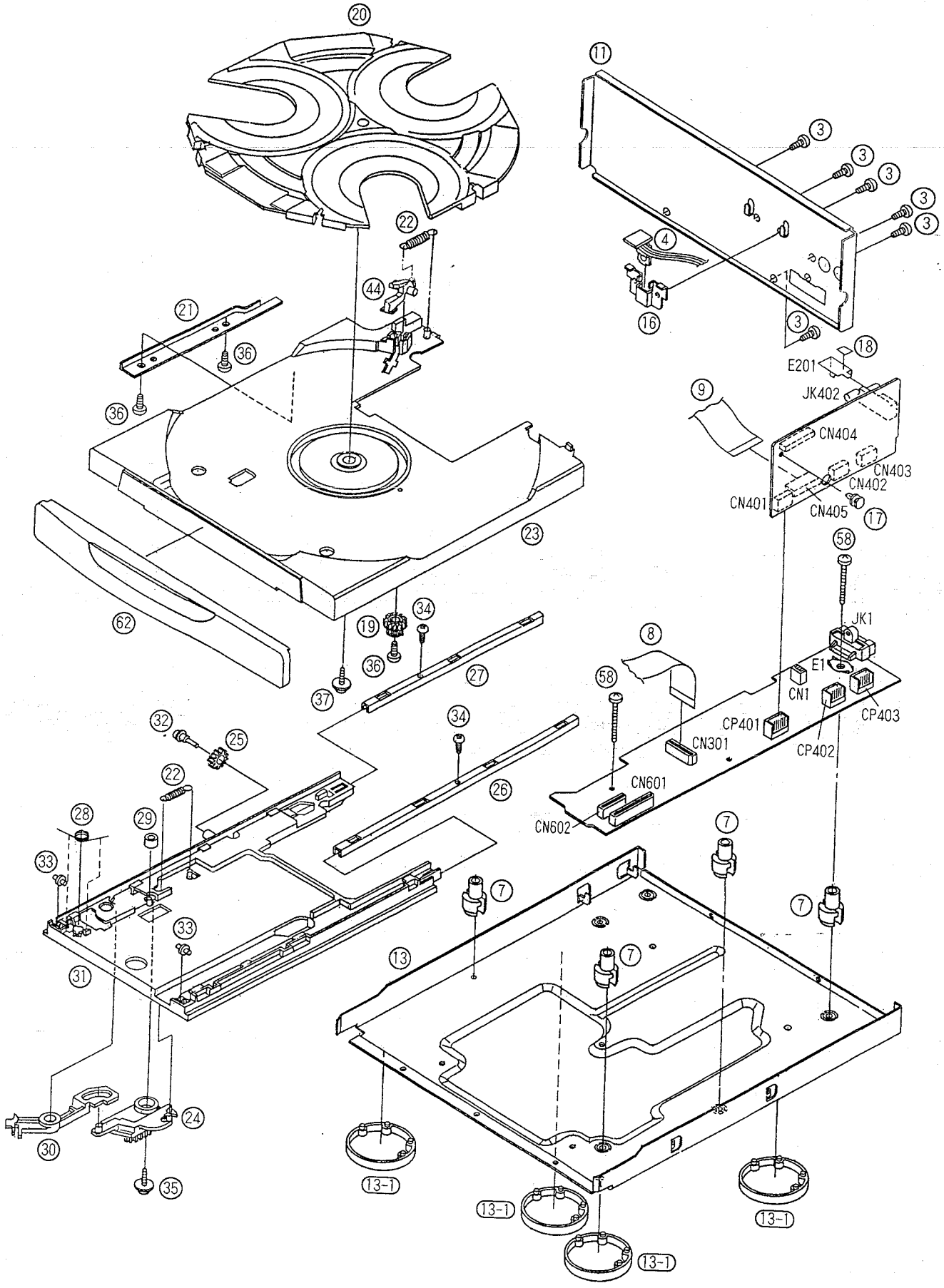
Note: When changing mechanism parts, apply the specified grease to the areas marked "××" as shown in the drawing.

Ref. No.	Part No.
❶	RFKXEM30L



■CABINET PARTS LOCATION

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JK402
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CN404
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JK1
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E1
CN1
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CP401
CP403
CP402
CN301
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CN601
CN602
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■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RKM0222-2K	CABINET	
2	RHD30007-K1	SCREW	
3	XTBS3+8JFZ1	SCREW	
4	REZ0651	FLAT CABLE(3P) (W1)	
5	RSC0416	SHIELD CASE	
6	XYC26+JF6	SCREW	
7	SHE185-3	P. C. B. SPACER	
8	REZ0555	FFC(14P)	
9	REZ0743	FFC(23P)	
10	REZ0748	FFC(30P)	
11	RGR0175F-BB	REAR PANEL	
12	RHD30043	SCREW	
13	RFKJLCH515PK	CHASSIS ASS'Y	
13-1	RKA0011-3	FOOT	
14	RMA0848	INSTALLATION PLATE	
15	RMN0086	SPACER	
16	RMN0261	ANGLE	
17	RMN0320	SPACER	
18	RMZ0294	SHIELD SHEET	
19	RDG0228	JOINT GEAR	
20	RGT0014	ROTARY TRAY	
21	RMA0681	ANGLE(C)	
22	RME0123	SPRING	
23	RFKNLCH555PK	TRAY ASS'Y	
24	RDG0225	CLOSE LOCK GEAR	
25	RDG0227	FRICTION GEAR	
26	RMA0654	ANGLE(A)	
27	RMA0655	ANGLE(B)	
28	RME0139	SPRING	
29	RMG0293-C	CUSHION RUBBER	
30	RML0291	TRAY LOCK LEVER	
31	RMR0627-K	TRAY BASE	
32	RMS0382	SHAFT	
33	SDRD14	ROLLER	
34	XTN2+6F	SCREW	
35	XTW3+6S	SCREW	
36	XTBS26+10J	SCREW	
37	XTWS3+10T	SCREW	
38	RDF0033	PLATE	
39	RHM245ZA	MAGNET	
40	RMR0334	FIXED PLATE	
41	RMR0624-W	DISC CLAMPER	
42	RFKNLCH610EK	CLAMP PLATE ASS'Y	
43	XTB3+6JFZ	SCREW	

Ref. No.	Part No.	Part Name & Description	Remarks
44	RML0312	LOCK LEVER	
45	RMN0195	FL SPACER	
46	RMN0315	FL HOLDER	
47	REZ0644	FLAT CABLE(5P) (W601)	
48	REZ0744	FFC(14P)	
49	REZ0745	FFC(23P)	
50	RFKGLVC1180E	FRONT PANEL ASS'Y	
50-1	RKW0392-V	FRONT ORNAMENT WINDOW	
51	RGL0281-Q	PANEL LIGHT	
52	RFKNL1160PPB	MAIN BUTTON ASS'Y	
53	RFKNL1160PPA	DISC BUTTON ASS'Y	
54	RFKNL1160PPC	SUB(1) BUTTON ASS'Y	
55	RFKNL1160PPD	SUB(2) BUTTON ASS'Y	
56	RFKNLVC1180E	SKIP BUTTON ASS'Y	
57	RMN0222	LED HOLDER	
58	XTB3+16JFZ	SCREW	
59	RMA0764	ANGLE	
60	RMG0319-K	RUBBER	
61	XTBS26+8J	SCREW	
62	RGK0713A-K	TRAY PANEL	
		<GREASE OR JIG/TOOL>	
		TEST DISC	
SA1	SZZP1054C	PLAYABILITY TEST DISC	
SA2	SZZP1056C	UNEVEN TEST DISC	
SA3	PVCD-K06	VIDEO TEST DISC	
		ALLEN WRENCH	
SA4	SZZP1101C	ALLEN WRENCH(M2.0)	
		LOCK PAINT	
SA5	RZZ0L01	LOCK PAINT	
		GREASE	
SA6	RFKXEM30L	MOLYCOAT GREASE EM30L	
		EXTENSION CABLE	
SA7	RFKZ0009	EXTENSION CABLE	